THE physical therapy REVIEW

The Role of the Physical Therapist in the Evaluation Studies of the Poliomyelitis Vaccine Field Trials — BLAIR, JACOBS, FRANCIS, and SALK

An Exercise Routine for Patients with Cup Arthroplasties — EGLI

Shoulder Girdle Function Following Exploratory Thoracotomy and Resection for Tuberculosis — MEIER

Trends in Physical Therapy — McGARRETT

Case Report — FREDRICKSON

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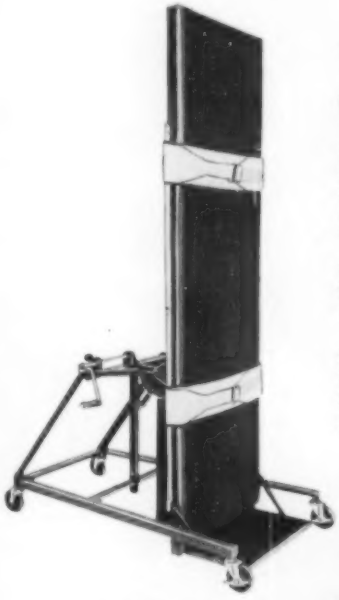

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Manuscripts are accepted with the understanding that they have not been published elsewhere. Contributions may be classified as "Feature Articles," "Suggestions from the Field," or "Case Reports." Feature articles are longer and deal rather extensively with the subject presented; suggestions from the field are brief and describe the instrument or device presented; case reports are short and concerned with discussion of a treatment for a specific type of disease or disability. All material should be presented in a clear, logical, and impersonal discourse.

Submit the original *manuscript* and one carbon copy (keep one carbon copy for your files). All written material should be typed, double-spaced with minimum margins of 1 inch on 8½ x 11 inch opaque white paper. Legends for illustrations, tables, references, and acknowledgments should be placed each on a separate sheet. When citing another author's work, a superscript numeral must appear in the body of the manuscript. The *references* must be accurate and numbered in the order in which they appear in the text. Include the name of each author, title of the article, name of periodical, volume number, inclusive pages, and date.

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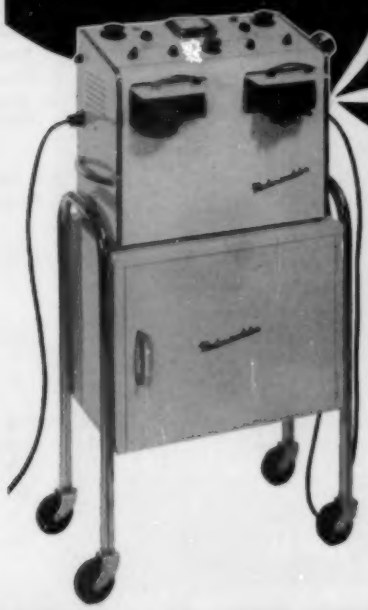

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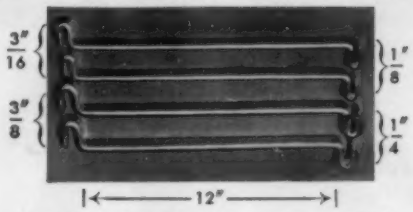

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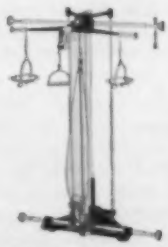

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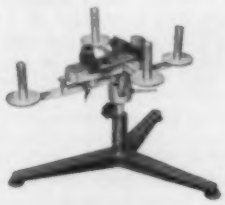

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Laughter can't be injected, swallowed or rubbed-in, but a good chuckle, taken regularly, is great therapy for what ails most of us. I ran across an editorial in the Los Angeles Times, April 30th issue, by columnist Jack Geyer, which I want to pass along in its entirety:

IN LOW GEYER

by Jack Geyer

Prior to an operation the doctor normally sends the patient through a rather thorough third degree.

This is understandable. In order to do a proper job the physician needs all the inside information he can get.

During this interrogation the patient is usually placed where the light shines in his eyes.

The doctor seats himself across the way, takes a form from his files and begins asking questions.

How old are you? How much do you weigh? How tall are you? Married? Children? How many? What sexes? Do you drink? How often and how much? Do you smoke? How much? Any previous operations? When? How is your general health? Do you have any brothers or sisters? How is their health? Parents living? How is their health? Are you allergic to any drugs? Do you have medical insurance?

By the time the doctor finishes, the patient doesn't know if he's been talking to an M.D. or a D.A.

It is my considered opinion that this interview should not be a one-way street. Why should the man in the white coat ask all the questions? If he's going to wield a medical machete on you, then you are entitled to some answers. Two can play at this game.

With this in mind, I've drawn up a series of questions designed to put the patient's mind at ease prior to a clinical coming-out party. As follows:

Doctor, how old are you? Do you drink? How often and how much? Do you smoke? How much? Filter-tips? How about coffee, Doctor, how many cups a day? How are your nerves, Doctor? You aren't, I trust, the type who jumps at unexpected noises? Do you get much exercise? How long have you been doing this type of operation? Where did you go to medical school? Did you really want to be a doctor, or were you following the wish of your parents? What kind of grades did you get in school? Especially in surgery? How long have you been wearing those thick glasses, Doc? Are they bifocals? And how long since you've had an eye examination?

Would it trouble you to furnish a list of five former patients who've undergone this particular operation? What was the name of your surgical professor in medical school? I'd like to give him a call.

Now, Doctor, nothing personal, of course, but about that diploma on the wall. I'm not saying it isn't yours, of course, but there are places where anybody can buy any kind of a diploma. Purely as a precautionary measure, would you mind giving me your fingerprints so I can check with the FBI to make certain you're really who you say you are?

Are you married? Happily, I mean. Are you the type who carries grudges? How about the fellow giving the anesthetic, Doc? Is he a good, steady citizen? The trustworthy type?

How's the food at this hospital, Doc? And how's the television reception? Can you get all the channels from here? Does my room have a good view? Any cute nurses?

Something else is bothering me, Doc. I know that everyone wears masks in the operating room. Now how can I be sure it's you in there and not some ringer? Do you guys wear numbers or something?

I notice that I'm going to have a local anesthetic. If the imported one is better, let's have that. At a time like this, money is no object.

When was the last time you bought a new set of tools? You know how it is, Doc, look sharp, be sharp, feel sharp.

And one last thing, Doc. Is this trip really necessary?

When I wrote Jack Geyer to ask his permission to reprint this there was a three week delay in his reply. Seems he went to the hospital for an operation a day or two after writing the above. He declined to state the nature of his surgery, making only the comment that he has been doing most of his work standing.

Cordially,

Cecil Birtcher

C. J. Birtcher, President
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The Role of the Physical Therapist in the Evaluation Studies of the Poliomyelitis Vaccine Field Trials

Lucy Blair

The role of the physical therapist in the evaluation studies of the poliomyelitis vaccine field trials could be answered in two sentences. Physical therapists were made available to perform manual muscle tests on patients included in a study which was conducted by Dr. Thomas Francis of the University of Michigan in 1954. The program was made possible through the financial support of the National Foundation for Infantile Paralysis and the liaison activities of the American Physical Therapy Association.

The activities in 1954 cannot be effectively described without a brief historical review.

Muscle testing has been part of the physical therapist's basic preparation since physical therapy courses and schools were developed in this country, and the manual muscle test has been used as a practical procedure to assist the physician in determining and developing the treatment program for poliomyelitis patients.

The physical therapist is taught to follow a definite regime—to observe and to record findings. Interpretation of the findings in relation to other clinical and laboratory information is the responsibility of the physician.

Physical therapists have participated in other studies concerned with the residual involvement of postpolio patients but the 1954 studies had additional implications.

Therefore, through the years, the poliomyelitis patient has influenced the physical therapist's performance in the patient's treatment program for restoration of function or adaptation to a life of restricted activity.

The impact of explosive poliomyelitis epidemics in this country, with the ever increasing numbers of patients needing care, has challenged our professional skills as well as pulled at our heart strings.

For years we have worked and hoped for new methods to use in obtaining better recovery, or the prevention, or the control of the disease which could be so devastating.

In the summer of 1951, the Research Division of the National Foundation for Infantile Paralysis asked the American Physical Therapy Association for assistance in locating a physical therapist with recognized ability, integrity, and judgment who could be expected to carry on a muscle testing program in relation to a field study in the use of gamma globulin as a prophylactic agent in poliomyelitis, being conducted by Dr. Hammond and his associates. There was a real tingling of anticipation that we were on the road towards the eventual control of a dread disease.

Through the D. T. Watson School in Pennsylvania, we were fortunate in obtaining the services of a physical therapist who responded promptly, upon call, to Provo, Utah, where the study was conducted. Muscle tests were per-

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formed in the hospital, home, clinic, or school, at certain stated periods, on patients accepted for the study. An astute observation of all deviations from normal function and accurate recording on record forms were stressed for inclusion with other data required for analysis and interpretation by the physicians on the research team.

The study was extended in 1952 requiring two additional physical therapists. Again we were fortunate in obtaining the release of physical therapists from Stanford University in California and Gonzales Warm Springs in Texas, and the studies were carried out in the environs of Houston, Texas, and Sioux City, Iowa.

There were measures taken to provide uniformity in the observation of the patient and recordings on the muscle test forms provided through written directions or "Rules of Operation" developed out of the experiences gained in the Provo study, for we were aware of the importance of common agreement in recording muscle power or weakness.

In June 1953, the American Physical Therapy Association was requested to obtain physical therapists, on relatively short notice, to participate in a nationwide study being conducted by the Public Health Service, in which muscle tests would be needed.

Many problems confronted us at once—were discussed and debated.

1. The great question of how many patients might be referred for muscle tests.
2. Who and how many physical therapists could be used for a study of this magnitude and how could service needs of patients be maintained?
3. Anticipating the timing of the muscle tests at stated intervals in relation to distances and means of transportation.
4. The question of variability in findings where it was expedient to have a number of physical therapists available in local areas, and recognizing that three or four physical therapists could not cover the entire country.

It was agreed that a standardized and abridged system of muscle grading should be established for this study and that all participants would receive specific orientation in the system to be used.

Because of factors in time, in that the 1953 poliomyelitis season was well on its way, identifying physical therapists promptly was of prime importance.

As State Health Departments were to be responsible for administering the program, official state agencies were contacted regarding available physical therapists on these services, who might be permitted to give priority in their work schedule to the muscle testing program. When physical therapists were not available through official state agencies, contacts were made with schools of physical therapy, poliomyelitis treatment centers, and local chapters of the American Physical Therapy Association for suggestions.

The first orientation session was held at the D. T. Watson School, during the middle of July 1953 for the physical therapists who would be participating in the eastern area of the country. An exact duplication, as to content, was given by the same instructors at orientation sessions held in Chicago and Los Angeles for physical therapists who would be serving in the middle and far western sections of the country.

It might be appropriate that we hear from Miss Jacobs regarding the development of the abridged muscle grading system and the orientation sessions at this point.

MIRIAM JACOBS

Since a nationwide study involved large numbers of patients and required numerous study personnel, first consideration had to be given to the formulation of an effective evaluation device which might be used by physicians and/or physical therapists.

Dr. Jessie Wright and her associates at the D. T. Watson School of Physiatrics were asked to explore the possibilities of developing an abbreviated system of muscle grading based on previous experience in the clinical evaluation of poliomyelitis patients and on experience gained in the field studies of 1951-1952.

Dr. Wright and her associates were well aware of the limitations of an abbreviated muscle grading system and that it could never replace the usual detailed muscle examinations required for treatment programs. However, an abridged muscle grading system appeared to be a reasonably practical method of assessing paralysis in a situation involving the evaluation and comparison of patients over wide geographical areas and requiring large numbers of examiners. The standardized abridged system of muscle grading was based on conventional methods using gravity and manual resistance as criteria of muscle strength.

Measures to insure the highest degree of uni-

formity of muscle evaluation were considered to be of prime importance since they would have to be performed by various study participants. It was necessary that the test be as simple and concise as possible. Originally it was thought that the tests might have to be administered not only by physical therapists, but by others such as physicians who may not have had previous experience in the technic of muscle testing.

The testing procedures were abbreviated, and the record form designed so that the muscle evaluation could be accomplished with maximum efficiency, in testing maneuvers and recording, in a reasonable period of time. The number of test maneuvers as required in the conventional muscle evaluation was reduced from 92 to 61.

All major muscles were included in the test but in some instances only group gradings were required. For example: The toe-flexors were graded as a group rather than individually as flexor digitorum longus, flexor digitorum brevis, and lumbricales. The number of muscles or muscle groups to be tested was reduced from 124 to 82.

Only six categories (normal, good, fair, poor, trace and zero) were agreed upon for grading to expedite analysis. Since the studies dealt with early poliomyelitis patients, the test procedures included evaluation of the muscles supplied by the cranial nerves in order to include information concerning brain stem involvement. As was mentioned earlier, it was thought in the preplanning stages that some of the suggested study participants were previously unfamiliar with the technic. Therefore no attempt was made to use plus or minus refinements in grading.

The record form provided space for checking (without strength grading) the functions of mastication, swallowing, and respiration, and facial, tongue, and palatal musculature. Muscle gradings for the trunk and extremities were recorded by letter, indicating **N**ormal, **G**ood, **F**air, **P**oor, **T**race or **Z**ero. The record form included anatomical outline drawings on which were recorded length and girth measurements to indicate the presence of muscle atrophy as well as facial involvement, spasm, contractures, and deformities. The record form also provided space for comments which might be necessary to clarify evaluation of muscle strength.

In order to determine a final numerical "index of involvement" of each patient, the letter grades were given numerical values; normal was designated as 0, and a completely paralyzed muscle or muscle group as 5. Next, each muscle or group of muscles was assigned an arbitrary factor of from 0.25 to 4 according to its bulk. This factor multiplied by the muscle grade was considered an indication of muscle involvement, so that, for example, a muscle with a bulk factor of 2 and a grade of 4 (poor) would be scored as 8. If all muscles were completely paralyzed a score of 470 would be recorded. The final index was based on the ratio of the score of involvement obtained to the highest possible score of 470 and expressed in a percentage figure ("percent involvement").

Another step in promoting uniformity in muscle grading was to provide an orientation session covering a four to five day period for the study participants.

Orientation sessions included:

1. An interpretation of the total field study program;
2. A concise review of anatomy, range of joint motion, and demonstrations of specific testing positions followed by laboratory practice by the participants in the precise procedures to be used;
3. Clinical practice carried out on normal subjects progressing to selected patients to give as wide a range of experience as possible;
4. Instructions in recording and handling the muscle examination form.

At the end of each orientation session, a small experimental trial to determine the variability between examiners was carried out. Physicians who were unfamiliar with the technic were included in some of the orientation sessions. It is interesting to note that the physicians agreed completely with the instructors in 60 per cent of muscles tested and within plus or minus one grade in 91 per cent of muscles tested.

At the end of three trials involving 38 physical therapists, a comparison of the absolute difference in scores between different examiners was approximately 3 per cent.

When comparisons were analyzed in terms of individual muscle grades, it was found that two examiners agreed in the grading of a muscle or muscle group in about 70 per cent of instances, and in about 95 per cent of instances they agreed within plus or minus one grade.

Each participant was provided with a syllabus which included: general principles of muscle testing, an explanation of the abridged muscle

evaluation form, an outline of the specific test positions to be used, an explanation of the scoring method, and an outline of the sequence of examination to be followed. Although an explanation of the method for scoring was included in the syllabus, the physical therapist was *not* expected to be responsible for scoring the examination.

The results of the experimental trials appeared to indicate that the system of muscle testing used had a high degree of reproducibility by different examiners. The carefully planned orientation of all participants to specific procedures, and a detailed syllabus provided for the participants for use in the field gave us reasonable assurance that there should be a high degree of uniformity in the muscle testing and recording desired by the administrators and evaluators of the study.

MISS BLAIR

Thirty-eight physical therapists were prepared in three orientation sessions. Following the orientation sessions, these physical therapists performed over 2,500 muscle tests, travelling over 100,000 miles and through 41 states and the District of Columbia in completing these examinations.

Through this period of time, we had become increasingly sensitive and aware of reports on the development of a poliomyelitis vaccine—and particularly of the work being done by Dr. Salk.

The announcement of the poliomyelitis vaccine field trials was exciting news and was heralded with great anticipation for the conquering of this dread disease in the future. Also, the announcement that Dr. Francis had accepted the tremendous undertaking of evaluating the study, was welcomed with great respect for his recognized ability and objectivity.

In the late spring of 1954, it was decided to use physical therapists in the follow up phase of the vaccine field trials. This phase of the study was conducted by the State Health Departments. Two muscle tests on patients included in the study would be needed. The first at a 10 to 20 day level and the second, at a 50 to 70 day period from the date of onset. From each muscle test completed, copies were to be made for the local health departments to be transferred to the State Health Departmnts, and finally to the Poliomyelitis Evaluation Center in Ann Arbor, Michigan.

We had gained some experience in attempting to meet such a request on a nationwide basis. Therefore, we used the same basic pattern in locating physical therapists as was employed in 1953.

The majority of the physical therapists who participated in the 1953 study were available for service again in 1954. However, to assure coverage in all study areas, additional physical therapists were needed for the 44 states and 3 provinces of Canada in which the field trials were conducted.

Planning the orientation sessions, understanding the channels for referral and reporting, setting up necessary records and reports, were a few of the details necessary to launch the program.

The orientation sessions were held at the D. T. Watson School and 38 additional physical therapists were instructed in the abridged muscle grading system and their responsibilities in the study.

Therefore, by the dates when the first vaccination clinics had been held, every physical therapist who had received specific orientation in the abridged muscle grading system was ready to accept patients that were referred for study through the respective health departments.

For months we were concerned in performing our assigned duties to the best of our ability, and we hope to hear from Dr. Francis as to how our small contribution was used or found helpful.

From May to the end of the year, over 2,000 muscle tests were performed on referred patients in 44 states and 3 provinces of Canada requiring over 130,000 miles of travel, exclusive of the mileage of one physical therapist who covered 5 states on a full time basis.

There were some problems in developing the systematic referral of patients, locating the patient, and maintaining interprofessional relationships.

Nevertheless, the loyalty, the cooperation, the prompt response to a call of duty and to good performance by the physical therapists, were a source of great satisfaction and pride to those of us who had a part in coordinating the program.

CHAIRMAN GRIFFIN: May I now, with great pleasure, call on Dr. Francis.

DR. THOMAS FRANCIS, JR.

Madam Chairman and Members of the Conference: I would like to tell you what a privilege it is to be here to discuss even briefly and in very general terms something of the role of the physical therapist in the evaluation of the poliomyelitis vaccine trials. Both Miss Blair and Miss

Jacobs have spoken of these as being a small part. I should like to emphasize, however, that it is practically impossible for me to express adequately the admiration and appreciation for the work done by the physical therapists and the Association in the poliomyelitis vaccine field trials of 1954.

It has already been pointed out that in the United States alone, there were 211 counties in 44 states that were to be covered, and the 3 provinces in Canada. The number of cases which were reported in the United States during the period from May 1 until December 31, 1954, were 1,103. With the wonderful aid of Miss Blair and the Association, 67 physical therapists agreed to undertake this work.

As Miss Jacobs has mentioned, she and Dr. Wright, in terms of their interest and previous experience in work of this nature, recognized the need of orientation sessions and the desirability of having uniformity of procedure and understanding. Therefore, the plan for examination and grading was unified and standardized.

Let me point out what this undertaking meant in terms of timing. It was agreed that the first muscle examination would be done in the period of 10 to 20 days after onset. This itself required a high degree of integration in the communications systems. You must realize that this study was unique in the banding together of so many diversified interests and people of various degrees of training and understanding, in an effort to give an answer to a question which was of interest to the nation and, actually, internationally. But, first of all, we have the fact that there is a family in which it is thought there is a case of poliomyelitis. The physician sees the patient and the physician then reports this to the local health officer or the agent carrying the responsibility in the particular area, in one of these 211 areas. The health officer informs the physical therapist of the presence of a case, its location and the date of onset. One readily can see the need for a constant alertness and mobility, but in addition, there was the necessity for a high degree of finesse and personal adaptability, since each case was likely to present a complex network of professional relationships which had to be carefully respected if obtaining the necessary data, month after month, were to proceed on good terms.

This, in my opinion—and I don't believe it is egotistic for me to say this, because we were not the people doing the work—was really epic in terms of interdisciplinary cooperation within a very broad field and a very broad problem. It is true that the role of the physical therapist was only a part of the problem, but it was a very essential part because it was on the examinations by the physical therapist that a great part of the decision was made as to whether a case was considered to be paralytic poliomyelitis or not paralytic poliomyelitis; so that became a constant part of the problem.

We had, in addition, of course, the physician, the virus research laboratories that were engaged in studying every case that occurred, and the actual problem of the evaluators in interpreting the results obtained from all these sources and interpreting them in a final decision as to the characteristic or the classification of a patient.

Our clinical advisers had emphasized the importance of the first examination, because development of paralysis might be present at that time, which later might have cleared, and if one were only to use residuals as evidence of paralysis, then one could be open to criticism that one was, perhaps, speaking only of severe grades and, furthermore, one was not really talking only of paralytic poliomyelitis.

The 10 to 20 day period after onset was chosen in the expectancy that spasm and apathy might be sufficiently reduced to permit an estimate of muscular weakness.

It was clearly understood that the physical therapist was not to be expected to make a diagnosis and it was asked that in each area, the authorities arrange to have the comments and the diagnostic impression of a specially qualified physician accompany the report of the detailed muscle examination.

I should like to show two slides only to illustrate the character of the muscle examination forms which have been described by Miss Jacobs, and which will give, perhaps, a clearer view of the pattern of procedure and the type of material with which we had to work in obtaining information.

This was the 10 to 20 day form. (*Slide*) The 50 to 70 day form was exactly the same but printed on different colored paper.

Presumably, the second muscle examination was to be done by the same physical therapist but without reference to the status of the patient at the 10 to 20 day examination.

Furthermore, in the placebo control areas, there would be no knowledge of whether the patient had received vaccine or placebo or was uninoculated, so, again, there would be no introduction of bias at that level in the examination, even though we would not expect it anyhow.

Also this shows the grouping of the muscles and the values given to them and the opportunity for scoring.

On the opposite side of the muscle examination form there is the anatomical outline drawing that Miss Jacobs described (*slide*). This permits a graphic description and comment of what is encountered. Also, there was space for additional comments by the physical therapist at the time of the examination.

It is here that we asked for the physician's interpretation; in other words, we asked for his estimate, if this were paralytic poliomyelitis or any other diagnosis. We were particularly anxious to have his comments on the status of the patient, and this might be a summary of his view of the patient up to the time the report was made.

This was one of our more difficult tasks for physicians, as you know, are notoriously busy. This required, therefore, a great deal of correspondence and telephoning and sometimes rather sharp pressures in order to obtain the desired information.

One of the reasons we were anxious to have this, as I mentioned, was that we felt we did want the impressions and the diagnosis of a physician who was particularly interested in poliomyelitis, and presumably was especially qualified, in order to have the balance of material for interpretation.

We had known that the physical therapists had had a common orientation and training for the muscle grading and for understanding of the detailed examination, whereas most of the physicians had not. So it was inevitable that the interpretation of the physical therapist's findings might differ from that of the physician in many instances. This requirement also put another link into the chain of performance and interrelationships, because in each instance, this meant that after the physical therapist had examined the patient, the physician was also to see the patient and write his report. Some of the difficulty was reduced by the fact that 80 per cent or more of all reported cases were admitted to a hospital, and consequently were more likely to be available readily.

The later examination, made 50 to 70 days after onset, was planned to demonstrate the degree of recovery which might have occurred, or the demonstration of weakness that might earlier have been missed or uncertain, and also the amount of residual impairment which existed.

By this time, the patient had commonly returned to his home, and the physical therapist was then confronted by the need to make arrangements with the family physician and with the family as to the time and convenience of seeing the patient.

I should emphasize that the physical therapist did this for the field trial, usually in addition to carrying on her regular full-time job in whatever activity she was engaged. One could not overemphasize the amount of travel and the physical energy, as well as the deep scientific interest, which the physical therapists gave to the study. This itself was a superb demonstration of devoted unselfishness in a cause of international interest.

To show how thoroughly the task was done, it can be pointed out that in only 13 per cent of instances was the first examination not completed within the designated time. In a majority of those instances, the patient was not reported in time, or there had been a delay in the notification to the physical therapist. In some instances, the patient was in a respirator or had had a tracheotomy or, for some reason, was too sick to permit a valid estimate of the degree of paralysis. Finally, only 3 per cent of patients did not receive an examination in the 50 to 70 day period.

I believe, if you think of this in terms of the extended lines of travel and the wide distribution of cases, and the fact that these were not always happening in home towns, it emphasizes how wonderful this coverage was.

The repeated review of examination reports by the Vaccine Evaluation Center at the University of Michigan clearly posed the question of interpretation. In this, we had the constant and valuable assistance of experts such as Dr. Jesse Wright, Robert Bennett, William Green, Horace Hodes and Franklin Topp, and Miss Jacobs often joined in. We had a great opportunity for these outstanding people to be able to view the data in the rough, and to consider the meaning of them, and to do all this without the knowledge of the patient, other than what was provided in the records.

It became apparent that a muscle graded as "good" could not be accepted as paralytic. There was too often widespread symmetrical weakness of this degree recorded on the examination. Moreover, it became apparent that neck and abdominal muscles were usually recorded to have bilateral involvement of both anterior and lateral muscles, even when the grading was "fair." Moreover, they usually were cleared uniformly by the time of the second examination. It was

Opening Scientific Session (left to right): Dr. Thomas Francis, Jr., Miriam Jacobs, Chairman G. V. M. Griffin, Mildred Elson, Lucy Blair, and Dr. Jonas E. Salk.

decided, therefore, that they could not be considered paralyzed.

Hence, a "good" grade was considered significant only when it was applied to one of the eight muscles characteristically affected by poliomyelitis—deltoid, triceps, finger extensors, opponens pollicis, gluteus medius, quadriceps, gastrocnemius, and anterior tibialis.

Muscles with "fair" ratings were considered definite with the exception of the neck and abdominals if there was bilateral involvement.

It is apparent that these criteria as to what evaluation was to be given to the muscle grading were established from examination of the results before any attention was given to classifying the patient with respect to the vaccination status. They were applied with complete uniformity and objectivity before the remainder of the data was examined. In other words, it was decided whether this patient could be called paralytic or not paralytic, or not anything without the people who made this decision having information or knowledge as to what the clinical diagnosis had been (except that all these cases had been reported as poliomyelitis), or information on the laboratory data, or information on what was going to be the final decision.

It was of interest, then, to compare the classification of reported cases as we finally established them, with that which was reported originally from the field. The next slide will show these figures.

You will note that out of the cases that were called nonparalytic in the field, of the 231 from the *Placebo* areas, there are 115 which ended by being called paralytic in terms of our final classification with the physical therapist and the physician's diagnosis. There were 45 that were called either doubtful or not poliomyelitis; so only 71 out of the nonparalytics were left as being nonparalytic poliomyelitis.

In the diverse sense, very few of the cases that were called paralytic at the start were called nonparalytic eventually. The majority of these remained in the paralytic group.

The features stand out in the next slide, which is from the *Observed* areas. We see that of 291 cases called nonparalytic in the reported diagnosis, only 77 remained nonparalytic in the final diagnosis, excluding the 55 of doubtful and not poliomyelitis, so here only about a fourth of the cases ended up as being nonparalytic as compared with the original diagnosis.

It ended up, then, that 67 per cent of all cases that were reported and considered poliomyelitis were called paralytic; 15 per cent were called doubtful or not poliomyelitis. This ends up, then, that 83 per cent of the cases considered to be poliomyelitis were classified as paralytic. I think it is clear from this that there had been no undue elimination of paralytic cases. The degree of paralysis of the patients varied from the minimal involvement of only one of the critical muscles graded as "good" to severe involvement

with a score of 200 or greater in terms of involvement.

Nearly 50 per cent of all cases reported as nonparalytic were finally classified as paralytic. It was frequently suggested, in discussions of our advisory group, that any case of poliomyelitis that had any evidence of central nervous system involvement showed some paralysis if carefully studied. The failure of vaccine to affect the instance of nonparalytic poliomyelitis indicates that we have transferred most of the nonparalytic poliomyelitis cases into the paralytic by this form of examination and classification.

I might mention, again, in the evaluation of these data, we could find that there was no difference in the frequency of paralytic cases occurring in Type I or Type II or Type III poliomyelitis virus; in other words, Type I was not the paralyzer and Type III the mild disease, but the frequency of paralytic disease in cases reported that had one or another of these viruses was approximately the same.

Another illustration of the type of problem that occurs in the evaluation of the muscle examination was seen in the cases from outbreaks of infection caused by Orphan virus or, as now called, Echo viruses. These are viruses which occur at the same season as the poliomyelitis virus and may be recovered from the intestinal tract. They cause a variety of illnesses or may be recovered from children showing no signs of illness. But the most common picture they gave us is the syndrome of aseptic meningitis. Cases associated with a virus of this nature occurred very frequently in an epidemic form in Massachusetts and Central New York State.

The cases were usually reported as nonparalytic or suspected poliomyelitis, although I think, generally, one would assume that there were more characteristics of aseptic meningitis. Only about 10 per cent of these were reported originally to have paralysis. But when we used the physical therapist's criteria nearly half of them would have to be recorded as being paralytic, even though practically all of them were in the minimal categories of paralysis and usually without residual. There were a few reported to have had mild bulbar signs, only four with major paralysis, and they may very well have been mixed cases of poliomyelitis virus and Echo virus infections.

The thing I would emphasize here is that, again, when one attempts to evaluate the minor degrees of impairment, this is where the major difficulty in interpretation occurs. There are, therefore, some deficiencies in the accuracy of manual muscle grading, even when major efforts are made to establish uniformity, and one wonders whether evidence should not be increased to obtain electrical measurements of muscle tone and function.

The consistency of results of any one person was quite striking. It was established for almost every therapist from the pattern of his or her muscle report. As in all other fields of specialization, they tend to specialize. One person may refer directly to the tensor fasciae latae, and another may see a deviation of the palate to the right. One had bilateral weakness for gastrocnemius too often, and they usually cleared up too frequently. One had what I would call a "Francis" profile —general asthenia—because most of the muscles were graded as "good" and very few as "normal."

These are the variations which made it necessary to decide upon the significance before applying it to a single patient at random. However, I would like to emphasize again that the program as a whole was a remarkable contribution. I am sure that it was the honest and conscientious examination of each patient, with unbiased confidence, which provides such solid answers to the question as to whether vaccine or placebo gives rise to the paralysis. Your records, which we were able to study and restudy, gave confidence to the reply that they did not.

There are so many reasons to be grateful to all of you for your splendid work in this activity. I would like, then, to thank you again and salute you both as a profession and as individuals who were of such great help to us. Thank you.

DR. JONAS SALK

When I thought that by appearing here as a discussant, I would make it easy for myself, I think now that I was quite wrong, because it is very difficult to decide which of the important feelings evoked by listening to the speakers up to the moment should be the one to refer to first. Perhaps, it would be well to say how nice it is to be at an international meeting of this kind, to see the many flags and many faces, irrespective of geography and points of view in other respects that bring a group of people together to deal with a matter of importance to all of them, and particularly it is well to recognize the nature of the efforts to which reference has been made thus far.

I am sure that some might think that this has the characteristics of a mutual admiration society meeting, but, really, the work that Dr.

Francis has referred to and the work that Miss Jacobs and Miss Blair have referred to was but part of a tremendous whole that could not have been carried out, of course, without the effort and contribution of people throughout the United States and Canada, who participated.

I dare say that there is hardly a household that did not have something to do with what you have heard about today. I must come back home, as I see in the audience faces of some of our very first volunteers who, back in 1952, were participants. These were physical therapists. I don't know how many of you are aware of the fact that the initial studies that were done in human subjects were done at the D. T. Watson Home. It was in the spring of 1952 that Dr. Wright and the late Dr. Harry F. Stambaugh, who was president of the board of trustees, considered our request and granted permission. It was Miss Lucille Cochran who made contact with the parents. It was the polio patients themselves recently paralyzed, convalescents, who served as the initial human subjects in opening these studies. It was from there that we moved on into other persons who were at the Home, not only patients, but staff as well.

I would ask them to stand, but I know it would embarrass them. I can tell you that without their help, directly and also personally, none of what followed would have been possible.

As for the genius that led to the decision to ask Dr. Francis—and I remember that he was in England at the time, Miss Griffin, and it was an overseas call that first brought to his attention the desire on the part of the National Foundation for Infantile Paralysis to ask him to evaluate the vaccine—were it not for the fact that he, with the excellent support of the physical therapists, had undertaken and carried out this task, and what comes to mind, that if there is anything worth doing, it is worth doing well—I need not say any more from what you have seen and heard. Were it not for that, much of the resistance to that change would have manifested itself in areas in which Dr. Francis, Miss Blair, Miss Jacobs, and others were concerned.

It is hard for me to conclude these thoughts and these feelings and these sentiments because the human aspects of the story have been overshadowed. I think, sometimes, all the attention to the immunologic details, to the so-called "scientific" aspects of this work, has been overemphasized because of the fact that it is really freedom from fear that has resulted in a great outpouring of emotion on the part of people.

Attention has been directed to this particular activity in a way that I don't understand; I don't understand why it should be any different from the activity in which I was associated with Dr. Francis, both as a medical student and in my early years on influenza vaccine. It was in his laboratory and with the efforts and assistance of fellowships supported by the National Foundation for Infantile Paralysis that I got my first experiences in virus work.

And so, when one sees the tremendous interest, one cannot possibly ascribe it to a scientific event alone. One must ascribe it to a great desire on the part of people to help themselves, and help themselves in an area where they are essentially helpless.

I could go on, and would like to, but I know that your program must conclude. I promised I would say something in answer to some practical questions concerning the question of dosage, the question of intervals between inoculations, and something about persistence of immunity.

(*Slide*) In this first chart, we have data that were presented at the American Medical Association meeting last Monday. You see here, antibody levels for Types I and II and III virus in persons who were vaccinated a year ago. Each symbol represents one individual. You will observe, the levels of antibodies in numerals are indicated in the left-hand column.

The second column of symbols indicates antibody levels a year after two doses. You will see that there is not a remarkable drop in antibody titers, but, then, at this particular point in time, one year point, a booster injection was given, the recommended third dose, and you see the extraordinary heights to which antibody levels are induced in viruses of all three types.

The next slide illustrates the effect of vaccine potency in producing a change in antibody level. These are data in children who have no antibody titers in the three types. We have the Type II story on this slide. You will observe that with diminishing quantities of vaccine, there is a reduction of the proportion of persons who have a response or an increase in the proportion of persons who do not respond. This is as you might suspect.

Thus, the efficiency or effectiveness of the single dose is in proportion to the vaccine potency. This is the dosage effect after one dose. If two doses are given, the effect is greater in terms of these, the number that remain here, so to speak.

The next slide is an interesting chart because

it illustrates another point about which there has been considerable scientific discussion. In the first frame, you see the levels of antibody after a single dose of vaccine, but in the middle frame, you see the levels of antibody produced by this same vaccine, this same single dose, when given to persons who were vaccinated with two doses the year previously and who had been given different quantities of vaccine the year previously. Thus, you can see that the effect of the booster is in proportion to the potency or intensity of the primary stimulus a year earlier.

In the right-hand frame, we have levels of antibody observed in paralyzed convalescents, very recently paralyzed, within a matter of a few weeks. You will observe the level of antibody found in persons naturally affected with a paralytic infection is of this order here, and some who receive vaccine artificially have levels of antibody greater than, and in others less than, that induced by infection. Thus, it would appear that with "purely artificial" means one can equal and, perhaps, slightly exceed the immunologic effects.

I remember a comment that Dr. Francis made at the last international meeting in Rome, when someone said this was the era of live virus vaccine. He said: "Why is it not the era of purified antigens, following the work of some of the great immunologists of recent years?" Here, essentially, is a demonstration that this plays a role. It must be expected in converting it into practical reality.

The next slide illustrates levels of antibody following booster in persons who received experimental vaccine in our laboratory, commercially prepared vaccines, and the controls. You see here that the order of magnitude is not too far different.

Here is an interesting study done using a very simple test for determining antibody level, adult blood obtained, where antibody titers of 1 to 64 can be demonstrated. Before vaccination, in a population of over 5,000 children, we have data on 4,617, of whom 18 per cent had no antibody to any of the three types, and 48 per cent of that antibody to one type. These were school children, and 28 per cent had antibodies for two types and a mere 4.8 per cent had antibodies for all three types.

After two doses of vaccine, you will notice that the I's taken once diminished, and the II's and the III's increased. But remember this is at a level of 1 to 64 or greater. It is believed that the level of 1 to 4 is what is needed for effective protection of the central nervous system.

After the third dose, 98.5 per cent had antibody levels of 1 to 64 or greater to all three types, and 65 per cent had antibody to two types only, and 4 per cent to one type only at the 1 to 64 level. The group shown was studied more intensively, as you will see in the next slide.

You will see that whereas 4,573 had antibodies at 1 to 64 or greater, the remainder had below that. There was 1 to 0, and, on retest, that turned out to be 4. But the point I wish to make is that there were few that had very low levels of antibody. The Type II response was excellent, and the Type III was of the order of magnitude shown.

The next slide shows a comparison of the prevaccination status. Of the 847 who had no antibodies, we see two things. After the second dose, 342 were at the level of 1 to 64, and, after the third dose, there were none, but there were 44 who were negative for one or two types, and you will see that they had antibody, all of them, to Type II, and some low levels of I and III, suggesting that persons in a population of some size, close to 5,000, included some who did not react to antibody formations, and probably vaccine potency is a factor that will increase the proportion of positive reactions.

Here are some observations showing the rise in antibody. (*Slide*) These are some of our early subjects at the D. T. Watson Home, vaccinated in May 1953 with two doses of vaccine. We see the rise in antibody of all three types. Seven months later, they were reinoculated, with a sharp rise. Then, there was a decline, a plateau, and, just for interest, we gave them a fourth dose of vaccine about 20 months later, and you see a further rise and a high order of persistence.

My purpose in showing these data was to illustrate the quantitative factors involved, to indicate why it is that three doses of vaccine are being suggested, and to indicate the importance of spacing of inoculations, because if the three doses are given more closely together than indicated, the effects you have just observed would not occur. Once again, let me tell you how pleased I am that I could be with you this afternoon and particularly to express my appreciation to the physical therapists for the tremendous support they have given, not only in our very early work, to those to whom I am personally indebted, but all the rest of you as well. Thank you.

MISS BLAIR: I would like to direct a few words to Dr. Francis and Dr. Salk, because I assume there are a good many in the audience who were participants in the studies in 1954.

Although you may know them on paper, I would like to present them to you in person. I am wondering if the physical therapists who participated in the studies of 1951, 1952, 1953 and 1954 will rise please.

I am sure I have expressed the feeling of these participants, as well as our Association, that it was our great honor and privilege to play a minor role in a great contribution that you have made to the people of the world.

MEMBERS OF THE PANEL

Lucy Blair, Consultant, Department of Professional Services, American Physical Therapy Association;

Miriam Jacobs, Instructor, D. T. Watson School of Physiatrics, Leetsdale, Pennsylvania;

Thomas Francis, Jr., M.D., Chairman of the Department of Epidemiology, School of Public Health, University of Michigan;

Jonas E. Salk, M.D., Research Professor in Bacteriology and Director Virus Research Laboratory, University of Pittsburgh School of Medicine.

An Exercise Routine for Patients with Cup Arthroplasties

Harold J. Egli, B.S.

As the Physical Medicine and Rehabilitation Department receives a large volume of cup arthroplasty patients, it was decided to standardize treatment of them. In the past various approaches and technics have been applied in an attempt to obtain ideal results, but many times the results were not satisfactory. With a goal of increased function it was felt that physiological principles should be considered. To achieve this a powder board exercise routine was developed.

To prepare a patient for definitive powder board exercises, the immediate postoperative care must be planned and executed carefully.

IMMEDIATE POSTOPERATIVE PHASE

While the leg is in suspension traction and in good alinement, the patient is instructed in muscle-setting exercises for the hip and knee groups and active ankle exercises. Instructions are started on the third or fourth postoperative day. The preceding elementary exercises, from this time to the convalescent phase, are designed to prevent venous stasis, contractures, and to lessen the possibility of phlebothrombosis and pulmonary embolism. From the twelfth day to the end of the third week, while the patient is still in bed, he is instructed in passive exercises to be done with exercise splints using ropes and pulleys. If the physician allows a skate arrangement for hip exercises at this time, it is most important to supervise the patient to prevent formation of bad habit patterns. It has been observed that patients will use the lateral abdominals, the quadratus lumborum, and even the latissimus dorsi to assist motion unless care is taken to make the exercise purely passive.

During the immediate postoperative period, pillows are always placed between the thighs when the patient is turned to the side-lying position. This prevents adduction beyond the saggital plane which may result in subluxation.

Proper bed posture is always stressed, chiefly with the idea of minimizing contractures. Joint tightness as a result of pre- and postoperative limitation of motion must not be increased by poor body alinement while the patient is in the immediate postoperative phase.

THE CONVALESCENT PHASE

After the third week the patient is brought to the department where the following is checked and recorded: active and passive range of motion of the hip and knee joints, movements that produce pain, degree of pain, and muscle strength. Certain irreversible changes may have occurred as a result of disease or surgery which

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will modify the potential strength and range of motion of the hip joint. The surgeon who had the opportunity to observe the tissues during the operation is in the best position to advise the physical therapist of any limiting factors. These factors may be organic or mechanical in nature. Where the hip arthroplasty patient is concerned, the working relationship between the physician and the physical therapist cannot be over emphasized.

For relaxation, relief of pain, and establishment of rapport between the patient and the physical therapist, heat and massage are administered as preparation for the exercise program.

The patient's active exercises are then instituted by using gravity-neutralized procedures on a powder board. It has been noted that most of these patients have a greater range than they demonstrate by active motion. This points up the protective reflex action of muscles in "splinting" or "fixating" a painful joint; all of the muscles about such a joint may go into spasm to prevent the part from being moved. For physiological and mechanical reasons, it was felt that this cycle of "pain-muscle splinting-contracture" could be more easily reversed by means of powder board exercises. One of the basic reasons, possibly fundamental to all the rest, is that the patient's limb is given support throughout its full range of motion. This reassures the patient and gives him the feeling of being in control of the exercise. Smoothness of movement, coordination, and increase in range of motion usually depend not only upon the proper degree of contraction of the prime movers, but also upon the proper relaxation of the antagonist. Since prime movers function best against resistance, the part to be exercised is loaded with sandbags to create the resistance. It is reasonable to assume that since the antagonists have no function in the movement, they relax and can be more easily lengthened. Actually, it was found in this routine that the antagonists tend not to activate so quickly as to interfere with the responses of the prime movers. In training muscles the nervous system also is being trained since all voluntary muscle contraction is dependent upon nervous energy. Since movement is patterned, we feel the re-education process is enhanced if movement is resisted, thus facilitating the response.

Figure 1. Position for starting hip flexion.

Exercise Routine

In the powder board exercise routine the aim is to increase range of motion and improve coordination as well as to develop muscle hypertrophy. Most patients exercise once daily, five days weekly. The first step is to determine the one repetition maximum (1RM)—defined as the amount of weight a muscle or muscle group is capable of moving through a normal range of motion once (in this case, on the powder board). When the 1RM is established it is divided into 50 per cent, 75 per cent, and 100 per cent; these 3 weight "break-downs" are then attempted with 10 repetitions per set. As soon as the originally established 1RM can be accomplished for 10 repetitions, a new 1RM is established.

It is important always to duplicate positioning of the sandbag resistance. In executing hip flexion and extension, the sandbags are draped over the distal end of the thigh. In hip abduction, and knee flexion and extension, they are draped over the distal end of the leg.

Equipment Design

The powder board is ¾ inches thick, 38 inches long, and 34 inches wide, with stationary legs extending 7 inches from the bottom of the board. A "cut-out," 8 inches in radius, is placed in the middle of the long side of the board to allow it to approximate the arc of motion which will be produced at the hip joint in executing flexion and extension. A board of the same dimensions without legs is used for hip abduction and adduction. The top is finished with a high gloss varnish.

The canvas sandbags are made in 2, 5, 10, and 25 pound units. Each unit is dumbbell shaped, thus making for a square bag at each end of a 5-inch canvas strap. This allows the

Figure 2. Position for executing hip abduction and adduction.

sandbags to be draped over or around an extremity without pressure of the weight directly upon it.

POWDER BOARD TECHNIC

Hip flexion is performed while the patient is side-lying on the unaffected hip with the affected thigh and leg supported on the powder board. With the knee flexed to 90 degrees, the patient actively flexes the hip as far as possible, in turn stretching the hip extensors. (Fig. 1) The physical therapist should stabilize the patient so as to give him the feeling of a fixed base from which to execute the movement. Support under the medial malleolus prevents possible abrasion and gives the therapist control over the limb. The leg can be passively returned to a position of extension, thus allowing the patient to concentrate fully on the motion of hip flexion. The medial aspect of the knee joint is padded with a towel to prevent friction burns and pain from contact with a hard surface.

In executing hip extension, the patient is positioned and stabilized exactly as for hip flexion, except that the starting position for exercise is from a position of maximal hip flexion. The patient concentrates on extending the hip from this position of maximal hip flexion. In so doing, he stretches the antagonist. The physical therapist passively returns the extremity to the starting position after each contraction.

Hip abduction is performed with the patient in the supine position with the unaffected lower extremity positioned and stabilized in abduction by means of a heavy sandbag placed against the lateral side of the leg. The patient then actively abducts the affected extremity as far laterally as possible without hiking the pelvis, although it is difficult not to hike to a limited degree at the extreme end of the range of motion. The thigh and leg are actively internally rotated as far as possible in executing this exercise. After the contraction the physical therapist repositions the extremity to the neutral or slightly adducted position (Fig. 2).

To execute the movements of knee flexion and extension the patient is side-lying with the board moved distally so that the leg rests upon it. The thigh is stabilized just superior to the knee joint by the therapist's thigh posterially, and his hand and forearm anteriorly. A towel is placed under the medial malleolus and the patient then actively executes the movements of knee flexion or extension as directed by the therapist. (Fig. 3)

DISCUSSION

Strict attention to detail is essential to obtain optimal results from these technics.

Duplication of the patient's position in relation to the powder board on successive treatments is essential for noting changes in strength and range of motion; in applying the sandbag resistance, the weights should be placed over the same landmarks.

The three main factors that create and modify surface traction or frictional resistance are: the area of surface contact between the extremity and the board; the quality, texture, and contour of the contacting surfaces; and the weight of the lower extremity plus the weight of the applied

Figure 3. Position for knee extension.

sandbag resistance. Most of these factors are relatively constant, the variable factor is the sandbag resistance. In turn, increases in strength are reflected in changes in the sandbag weights.

To promote muscle hypertrophy by this means, a slow, coordinated contraction is desirable. This is especially true during powder board exercise since speed introduces inertia as an uncontrolled variable. Since the muscle would not have to work through a full arc of motion, it would not be overloaded to promote a maximal contraction.

Always related to the task of reeducation and hypertrophy in cases of loss of muscle power is the problem of substitute movements. An axiom to remember is that no muscle has pure action, but functions according to the position in which you place it. Following a hip arthroplasty, the basic substitute movements noted are: pelvic tilting to aid hip flexion and extension; hiking the pelvis with the quadratus lumborum, lateral abdominals, and the latissimus dorsi in an attempt to abduct the thigh; externally rotating the femur, in performing hip abduction, to bring the hip flexors into play; and executing a concurrent contraction in performing knee flexion and extension. By allowing the patient to flex at the hip, concomitant with knee flexion, the true "load" on the extremity is dissipated tremendously. By employing reeducation principles with resistive exercises, along with stabilizing for promoting a fixed base from which to work, these patients can avoid developing faulty habit patterns in muscular movements.

Progression of Program

When a patient approaches a normal range of motion at the affected joint and the sandbags become unwieldy, through bulk, the patient is transferred to exercises on the DeLorme table as outlined in a paper by DeLorme and Watkins.[7] Most of the patients continue on a home treatment program until the physician feels that maximum results have been derived. This usually is a matter of months.

Observations

Pain was less pronounced and tended to be a factor during stretching procedures only. No attempt is made to break through the pain barrier.

All patients had limited range of motion in all planes. Hip abduction was always the most severely limited. Most current literature on this subject emphasizes the importance of "stretching out" hip extensors and thereby increasing hip flexion mobility. This was found to be true, but it was also noted that the inability to extend the hip due to hip flexion contractures was just as marked and worthy of consideration.

Most of the patients gained optimal increase in range of motion within the first three weeks of exercise.

Summary

A program of physical treatment following hip arthroplasties stressing the use of the powder board has been presented. The advantages of this technic can be summarized as follows:

It is ideal for positioning the patient to minimize substitution movements;

The exercises can be done in a gravity-neutralized position, thus eliminating to some degree the pain which is often encountered in the gravity-assisting or gravity-resisting positions;

It permits the patient to "stretch" himself actively;

It alleviates apprehension by allowing the patient to feel that he is under complete control of the exercise.

Patients tend to obtain a greater range of motion much earlier than if placed on gravity-assisting or gravity-resisting exercises.

References and Bibliography

1. Burwell, H. N., and Scott, D.: A Lateral Intermuscular Approach to the Hip Joint for Replacements of the Femoral Head of a Prosthesis, J. Bone Surg., Vol. 36B:104, (February), 1954
2. Committee of Scientific Investigation of American Academy of Orthopedic Surgeons: Preliminary survey of femoral head prosthesis, J. Bone Surg. Am., Vol. 35A:489, (April), 1953
3. Darcus, H. D.: The Functional Anatomy of the Locomotor System, Physical Medicine and Rehabilitation, Springfield, Charles C Thomas, 1953, pp. 5-40
4. D'Aubigne, R. M. and Postel, M.: Functional results of hip arthroplasties with acrylic prothesis, J. Bone Surg. Am., Vol. 36A: 451, (June), 1954
5. DeLorme, T. L.: Exercise, Physical Medicine in General Practise, New York, Paul B. Hoeber, Inc., 1952, pp. 397-405
6. ———: Heavy resistance exercises, Arch. Phys. M., Vol. 27:607, (October), 1946
7. ——— and Watkins, A. L.: Techniques of progressive resistance exercises, Arch. Phys. M., Vol. 29:263, (May), 1948
8. ———: Progressive resistance exercises in cup arthroplasties of the hip, Arch. Phys. M., Vol. 30:367, (June), 1949
9. Duchenne, G. B.: Physiology of Motion, Philadelphia, J. B. Lippincott Company, 1949, pp. 245-274
10. Elkins, E. C.: Basic principles used in therapeutic exercise, Physical Medicine and Rehabilitation for the Clinician, Philadelphia, W. B. Saunders Company, 1951, Chapter 5
11. Ghormley, John W.: Hip Motions, Am. J. Surg., Vol 66:26, 1944
12. Gray, H.: Anatomy of The Human Body, Philadelphia, Lea and Febiger, 25th Edition, 1950, pp. 206-230, 311-317, 404-480
13. Haley, E. T.: Range of hip rotation and torque of hip rotator muscle groups, Am. J. Phys. M., Vol. 32:261, (October), 1953
14. Hollinshead, W. H.: Functional Anatomy of the Limbs and Back, Philadelphia, W. B. Saunders Co., 1951
15. Horwitz, I., and Lenobel, M.: Artificial hip prosthesis

in acute and non-union fractures of the femoral neck, J. Am. M. Ass., Vol. 155:564, (June), 1954
16. Inman, V. T.: Function of the abductor muscles of the hip, J. Bone Surg. Am. Vol. 29:607-619, (July), 1947
17. Judet, J. and Judet, R.: Technique and results with acrylic femoral head prosthesis, J. Bone Surg. Vol. 34B:176, (May) 1952
18. ———: The use of an artificial femoral head for arthroplasty of the hip joint, J. Bone Surg. Vol 32B: 166, (May), 1950.
19. Judovich, B. D.: Lumbar traction therapy-elimination of physical factors that prevent lumbar stretch, J. Am. M. Ass., Vol. 159:549-550, (October), 1955
20. Kenrich, Margaret and Hansson, K. G.: Post-operative rehabilitation in hip arthroplasties, Arch. Phys. M., Vol. 36:434, (July), 1955
21. Kovacs, R. and Kent, H.: Physical Methods Used in Treatment, Physical Medicine and Rehabilitation, Springfield, Charles C Thomas, 1953, pp. 436-440
22. Krusen, F. H.: Physical Medicine, Philadelphia, W. B. Saunders Co., 1943, pp. 550-626
23. Marcy, G. H. and Fletcher, R. S.: Modification of postero-lateral approach of hip for insertion of femoral head prosthesis, J. Bone Surg. Am. Vol. 36A:142, (January), 1954
24. McBride, E. D.: A femoral head prosthesis for the hip joint; four years experience and results, J. Bone Surg. Am. Vol. 34A:989 (October), 1952
25. Mendelsohn, H. and Alborn, S. L.: Complications in replacement arthroplasty of the hip, J. Bone Surg. Am. Vol. 36A:30, (January), 1954
26. Moseley, H. F.: Disorders of the hip, Ciba Clinical Symposia, Vol. 5, Number 2 (March-April), 1953
27. Peterson, L. T.: The use of metallic femoral heads, J. Bone Surg. Am. Vol. 33A:65, (January), 1951
28. Ralston, H. J.: Mechanics of voluntary muscle, Am. J. Phys. M., Vol. 32:166, (June), 1953
29. ——— and Libet, B.: The question of tonus in skeletal muscle, Am. J. Phys. M., Vol. 32:85, (April), 1953
30. Slocum, D. B.: An Atlas of Amputations. St. Louis, The C. V. Mosby Company, 1949, pp. 289-309
31. Smart, M.: Manipulation, Arch. Phys. M. Vol. 27:730, (December), 1946
32. Thornton, L.: Hip Fractures, Surgical Treatment of the Motor-Skeletal System, Philadelphia, J. B. Lippincott Company, Vol. 36:1037, 1951
33. Wakim, K. G.: The Skeletal Musculature in Health and Disease, Physical Medicine and Rehabilitation for the Clinician, Philadelphia, W. B. Saunders Co., 1951, Chapter 37
34. Watkins, A. L.: Physical medicine and rehabilitation in hip disabilities, Arch. Phys. M., Vol. 35:747, (December), 1954

Shoulder Girdle Function Following Exploratory Thoracotomy and Resection for Tuberculosis

Ruth Pulling Meier, B.S.

The following report is the result of tests and observations made on patients who had pulmonary resection for tuberculosis. The records were made for a study on the effect of the surgery on shoulder function on the operated side. This report includes 310 of the cases seen in the 6 years from 1950 through 1955. All of the patients for which complete records were available are included. Surgery through a lateral approach required division of the latissimus dorsi and serratus anterior muscles, as well as the lower portions of the trapezius and the rhomboids. The fifth rib was resected.

PROCEDURE

The procedure used evolved from the program of Physical Therapy in Thoracic Surgery for Tuberculosis initiated in the Veterans Administration hospitals in late 1946. The changes and adaptations have been brought about by numerous factors—resection largely replacing thoracoplasty, ambulatory treatment replacing bed rest regime, varying wishes of the surgeons, staff availability, and the experience gained by the physical therapist during the years this type of treatment has been used. Without exception, the surgeons have welcomed physical therapy for their patients. The patients themselves now expect this treatment as part of the surgical program. The procedure is uniform with each patient but is flexible enough to adapt to individual needs and reactions.

Preoperative treatment

The preoperative phase of the treatment is initiated at least two days before the surgery is scheduled. A conference with the patient affords an opportunity to achieve a friendly therapist-

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patient relationship, which is important in any treatment. The physical therapist is alert to the needs for posthospital vocational assistance or social service help so that appropriate additional referrals may be made. Thus the patient is given a feeling of security that his future is being considered and that the professional personnel are ready to help him in meeting his problems. The purpose of physical therapy treatment is explained, also the importance of acquiring skill before surgery in the exercises and breathing technics that will be used afterward. The patient's responsibility for frequent use of these procedures after his surgery is stressed. This conference is an excellent time for reassuring the patient to help allay the inevitable preoperative apprehension.

Following the conference active preoperative treatment begins. An evaluation of posture, range of shoulder motion, scapulohumeral rhythm, and muscle strength of shoulder girdle muscles is made and recorded. Posture training is usually needed and takes the form of teaching the patient to stretch as tall as possible in both the sitting and standing positions. A record of preoperative range of shoulder motion is made, and this is considered normal for the patient. If there is a history of previous disease or injury which affects shoulder motion, a note is made of this. The exercises to be used postoperatively are demonstrated standing and in the supine position in which they will be used in the early postoperative period. These include shoulder abduction, flexion, rotation, and horizontal adduction. The patient's responsibility for doing these exercises several times daily after surgery is again explained. The patient is taught unilateral, segmental breathing for the side to be operated. He is instructed in practice of this and urged to do it frequently. His skill in this is rechecked before surgery. Diaphragmatic breathing with emphasis on long exhalation, for his use postoperatively in raising mucous, is also taught.

Early postoperative treatment

The early postoperative treatment usually begins the day after surgery. Before treating the patient the physical therapist consults with the nurse in charge of the recovery unit regarding the patient's condition, surgery performed, and specific orders. Usually treatment may be started immediately—commencing with shoulder exercises. Range of motion is performed in all directions as far as bandage, drainage tubes, and pain permit. Assistance is given if needed. However, with only a little encouragement the patient usually can achieve active motion, unassisted, even during the first treatment. Unilateral, segmental breathing and diaphragmatic breathing are performed under supervision to be sure the patient remembers both. The patient is urged to practice shoulder exercises and correct breathing frequently between visits by the physical therapist. The patient's attention is called to relaxation of the upper trapezius, which frequently exhibits a protective spasm. Bed posture is not stressed at this time. The patients are ambulatory in a short time and posture practice may safely wait until then. Nurses and aides on duty in the recovery unit are often helpful in reminding patients to practice exercises and breathing. The surgeons also stress the importance of these as they make their rounds.

The patients are seen by the therapist each day. As quickly as possible, progression is made to exercise in the sitting and in the standing positions. On the second day, even with drainage tubes still in place, patients often do their exercises sitting on the edge of the bed. Drainage tubes are usually removed and patients are ambulatory within a few days following surgery. A portable, full-length mirror is brought into the rooms for use during treatment, and this is also available on the ward for patients' use between visits by the physical therapist. As soon as sitting and standing work is begun, posture is constantly stressed; and this emphasis continues as long as the patient is under treatment. Spasm of upper trapezius frequently occurs but responds to massage, which is given as needed. In the sitting and standing positions exercises are done with both arms. The bilateral use of arms helps to avoid body tilt due to pain and to the effort required to lift the affected arm. The normal range of motion on the unoperated side also serves as a constant reminder of the eventual goal for the other shoulder. Bandages and sutures are usually removed one week postoperatively, and then the patient is urged to increase his range of motion by an extra stretch during each exercise. The aim is, first complete range of shoulder motion, then strength of shoulder girdle muscles. Massage is given over the scar area, shoulder joint, and arm if need is indicated by pain and discomfort.

Intermediate postoperative treatment

One to two weeks postoperatively the patient is transferred from the recovery unit to the surgical ward. He is then expected to report

to the Physical Therapy Clinic daily. These visits are primarily for evaluation of progress and encouragement. The patient is expected to practice exercises and breathing many times daily, and full-length mirrors are provided in the wash rooms for patients' use. Massage may also be given as part of this daily treatment. On medical order diathermy or radiant heat is used when postoperative neuritis occurs. Range of shoulder motion may be normal within three weeks following surgery. If not, stretching exercises are taught. Treatments are gradually spaced farther apart as patient resumes normal activities.

Late postoperative treatment

Three months following surgery the patient is called to the Physical Therapy Clinic for recheck. Again, as preoperatively, range of shoulder motion, scapulohumeral rhythm, and posture are recorded. Posture is often unchanged, but sometimes a remarkable improvement is noted. Strength of the following shoulder girdle muscles is tested: trapezius—middle and lower, serratus anterior, latissimus dorsi, and rhomboids. The manual tests used in poliomyelitis and familiar to all physical therapists are used. When there is marked weakness of any muscles, the exercises which are indicated for this are carefully retaught; and the patient is urged to do them several times daily. Patients are also urged to use the available rehabilitation facilities to improve shoulder girdle function. They are referred to Manual Arts Therapy or to Occupational Therapy Clinics for some activity especially planned to strengthen the weaker muscles.

The patients are usually cooperative and expect physical therapy as part of the whole surgical program. The amount of help and encouragement required by patients during the early postoperative stage varies markedly. After some years of observation it seems that, apart from the more tangible contribution that physical therapy makes in range of motion, lung function, and strength of muscles, there is another valuable factor in this program. The patient has something that he alone must do for himself during a period when others take over much of the responsibility for his welfare. It gives the patient some responsibility for the final result.

RESULTS

The following data on range of shoulder motion, scapulohumeral rhythm, and strength of shoulder girdle muscles is based on the tests made three months following surgery. Improvement is possible after this period; but, for testing purposes, this length of time seemed a reasonable recovery period.

The following terms are defined for better clarification of our meaning. *Limited* as used in reference to shoulder motion means failure to obtain freedom in range of shoulder motion in flexion, abduction, or rotation. No attempt was made to measure this limitation in degrees because it usually was slight. The patients were not usually aware of it although it was obvious to the therapist. *Disturbed* as used in reference to scapulohumeral rhythm is defined as unusual scapulohumeral movement on flexion, abduction, or rotation of the shoulder. Irregular rise and/or flare of the scapula is the usual picture presented in these cases, and the uneven motion may be very slight. *Impaired* as used in reference to strength of shoulder girdle muscles refers to any degree of muscle weakness disclosed by manual testing as described under procedure. This does not imply extensive weakness, as will be obvious upon studying the reports.

A. Cases studied:

1. Total number of cases	310
2. Bilateral	64
3. Unilateral	246
a) Left 95	
b) Right 151	
4. Composite—total number of shoulders tested	374

B. Bilateral—64 Patients

	Per Cent	
1. Range of shoulder motion	*Left*	*Right*
a) Normal	93.8	100
b) Limited	6.2	
2. Scapulohumeral rhythm		
a) Normal	73.3	78.2
b) Disturbed	26.7	21.8
3. Strength of shoulder girdle muscles		
a) Normal	71.9	67.2
b) Impaired	28.1	32.8

C. Unilateral

Left — 95 Patients
Right — 151 Patients

1. Range of shoulder motion		
a) Normal	89.5	93.4
b) Limited	10.5	6.6
2. Scapulohumeral rhythm		
a) Normal	61.1	66.9
b) Disturbed	38.9	33.1
3. Strength of shoulder girdle muscles		
a) Normal	53.7	54.3
b) Impaired	46.3	45.7

D. Composite—374 Arms

	Per Cent
1. Range of shoulder motion	
a) Normal	93.6
b) Limited	6.4
2. Scapulohumeral rhythm	
a) Normal	68.4
b) Disturbed	31.6
3. Strength of shoulder girdle muscles	
a) Normal	59.4
b) Impaired	40.6

E. All Tests Normal	*Per Cent*
1. Left	50.3
2. Right	51.2
3. Bilateral	45.3
4. Composite	50.5

F. Muscle Weakness

1. The following percentages are based on total number (374) of shoulder girdle muscles tested:

Muscle	*Impairment Per Cent*	*Normal Per Cent*
Trapezius—lower	35.3	64.7
Trapezius—middle	32.6	67.4
Serratus Anterior	13.6	86.4
Latissimus Dorsi	4.5	95.5
Rhomboids	1.3	98.7

2. The following percentages are based on total number of each muscle showing weakness. Only one, a lower trapezius, tested below Fair or 50 per cent of normal. This one was graded Poor-plus or 30 per cent of normal.

	Grades	
	Fair or 50% of Normal	*Good or 75% of Normal*
Muscle	*Per Cent*	*Per Cent*
Trapezius—lower	40.9	59.1
Trapezius—middle	40.9	59.1
Serratus Anterior	27.5	72.5
Latissimus Dorsi	.6	99.4
Rhomboids	2.0	98.0

CONCLUSIONS AND OBSERVATIONS

An exercise regime has been described for restoration of shoulder girdle function following exploratory thoracotomy and resection for tuberculosis. A study of the statistics indicates that there is consistently satisfactory shoulder girdle function following exploratory thoracotomy and resection when adequate physical therapy is available. The weakness recorded is not extensive, and muscle strength should continue to improve even after three months, when this case study terminated.

The following observations are also presented:

1. There was no deformity attributable to surgery.
2. Atrophy of middle and lower trapezius was frequently observed. This did not always affect demonstrable muscle strength or scapulohumeral rhythm.
3. Frequent spasm (protective) of upper trapezius occurred shortly after surgery, but this responded to massage and was not usually persistent.
4. In a very few cases there was persistent substitution of the upper trapezius in flexion of the shoulder.
5. On flexion of the shoulder a "bulge" sometimes persisted over the scar area along the line of latissimus dorsi pull. This did not affect strength of the latissimus and probably was the result of muscle repair at the time of surgery.
6. The scapulohumeral rhythm was frequently disturbed, both with and without weakness of middle and lower trapezius or of serratus anterior.
7. Patients who were tested after functional occupational or manual arts therapy usually showed improvement.
8. Complaints of postoperative discomfort and pain varied widely among patients.

Our Book Reviewers For July

Miriam Rodenberger Bender, Major (MSpC), OIC Physical Therapy Section, Eglin Air Force Base, Florida.

Mary Callahan, Director of Training, Physical Therapy, College of Physicians and Surgeons, Columbia University, New York.

Eleanor J. Carlin, Associate Professor and Assistant Director, Division of Physical Therapy, School of Auxiliary Medical Services, University of Pennsylvania. Philadelphia.

Frederick E. Vultee, M.D., Assistant Professor, Physical Medicine and Rehabilitation, Medical College of Virginia, Richmond.

Trends in Physical Therapy

Adelaide L. McGarrett, Ed.M.

Growth of the Profession

Physical therapy has come of age and this maturity is reflected in the American Physical Therapy Association which has faithfully served the profession for 35 years. During this time the membership has increased from 200 to 7,338 members. The Association has elevated physical therapy from a technical vocation to a profession. Yet, a report released Feb. 10, 1956, by the Health Resources Advisory Committee of the Office of Defense Mobilization states that a nationwide shortage of trained workers including physical therapists prevents the benefits of modern rehabilitation from reaching large numbers of the nation's disabled. There is not even one physical therapist per hospital in the United States.[1]

Because of the increased use of physical therapy and the increase in the number of hospital beds there is a need for more than 11,000 physical therapists. Taking into account the physical therapists required for treatment programs other than hospital programs, the projected number this year becomes 13,500.

The number of physical therapy schools approved by the Council on Medical Education and Hospitals of the American Medical Association has increased from 13 in 1936 to 37 in 1956. The enrollment in the senior classes and accelerated courses has increased from 138 to over a thousand. The number of graduates in 1941 was 238; the estimate for 1956 was 700.[1] Both certificate and bachelor's degree programs are offered. That the trend is toward the degree program is shown by the fact that only 7 of 32 schools offered a degree in 1945, as compared with 26 of 37 schools in 1956.

World Trust

In the summer of 1955 I had the privilege of visiting in 11 of the free countries on the other side of the Atlantic. I had been awarded a Physical Therapy Travelship from the National Foundation for Infantile Paralysis for 10 weeks of intensive touring, observation, and study of physical therapy schools, hospitals, and clinics in Scotland, England, Norway, Sweden, Finland, Denmark, the Netherlands, Austria, Italy, Switzerland, and France.

One of the most significant events in the history of the growth of the physical therapy profession has been the organization of the World Confederation for Physical Therapy. My trip overseas could not possibly have been as meaningful or such a rich experience if it had not been for the cordial courtesy extended to me in the many countries I visited by people representing member organizations. In each country I immediately felt at home because of the friendly interest, concern for my welfare, and planning both professionally and socially by these people.

It was clear from the first that the formation of the World Confederation and the First Congress meetings in London demonstrated that physical therapists in the member countries are dedicated to high standards of ethical practice and realize that high educational standards are essential to the best patient care. Everywhere physical therapists were more than anxious to share information concerning their education and treatment programs and expressed interest in what is being done in the United States. Other than the trend toward group work, I observed that almost everywhere there was great interest in proprioceptive neuromuscular facilitation.

Physical therapy, in my observation, is regarded with importance in the countries I visited. In round figures the population of England, Scotland, Wales, and Northern Ireland is 50,000,000; the population of the United States is 150,000,000. Yet there are 19,000 members of the Chartered Society of Physiotherapy and only 7,338 members of the American Physical Therapy Association. This information emphasizes the fact that we have much to do to meet the needs of our people here in the United States. Our present supply of qualified physical therapists and our existing facilities for training do not constitute an adequate mobilization base to meet the increased needs which would result in the event of national disaster.[2]

It is imperative to recognize the potential role that is ours when we realize that the National Health Program in Great Britain, a voluntary national health program in Denmark, and social

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insurance programs of greater or lesser magnitude in the other countries, make it possible for the people to have everything that medical care can offer. This means that physical therapy is available to thousands, and that the case load far exceeds ours in this country.

I visited 9 physical therapy schools, 27 hospitals, 5 great universities, and 19 professional organizations. Among these organizations were the Chartered Society for Physiotherapy in London and the Netherlands Society for Physiotherapy. Treatment centers of interest included Vauxhall Motors near London, an orthopedic outpatient clinic and a rehabilitation center in Oslo, one near Amsterdam, one in Paris, and a cerebral palsy program in Sweden. In Finland I visited convalescent homes, a veterans program, a home for the aged, and a cabin of an agricultural family. In Copenhagen, there was an outpatient poliomyelitis institute and an occupational therapy school; in Holland, a military hospital, a private doctor's office, and prenatal classes.

To carry out the countless orders for treatment it has become necessary in the foreign countries to find ways for providing multiple treatments. In one hospital I visited I saw four patients—each with a lower extremity under a single hood baker—enjoying their "heat treatment" together. In London I saw large group-work treatment rooms. As I visited the hospitals I saw classes for amputees, paraplegics, asthmatic children, and antenatal groups; walking classes, non-weight-bearing classes, weight-lifting classes, sling classes, calisthenics classes and many others. The patients seemed to be participating enthusiastically. The physical therapists were extremely conscientious and busy assisting and correcting the patients. At one London hospital I was taken to the surgical ward where patients exercise every morning for about 10 minutes. The physical therapist watches over as many as 14 beds while he instructs the patients in breathing, and leg and foot exercises. There is evidence that these patients have a better convalescence than patients had in the past without exercise.

PHYSICAL THERAPY TRENDS IN THE UNITED STATES

New procedures

What are the trends in the United States? The use of *proprioceptive neuromuscular facilitation* probably is more generally regarded as an effective means of treatment than anything else that is new at the moment. Many patients are being treated effectively by this method.

Physical therapists have found that the terminology used in discussing proprioceptive neuromuscular facilitation is confusing. These terms are familiar to the physical therapist as words, but their clinical application is unfamiliar. The term "facilitation" itself is used more frequently in recent literature and in its simplest definition means "the making easy or less difficult."

It is necessary to turn to the literature to get a complete definition of terms. Patterns of motion are spiral and diagonal in character in keeping with the spiral and diagonal structural characteristics of the bones and joints, the ligaments and the alinement of the muscles upon the skeleton. Technics of proprioceptive neuromuscular facilitation are methods of placing specific demands in order to secure a desired response.[3] The use of proprioceptive neuromuscular facilitation patterns and technics comprises a real skill. It is highly desirable to participate in a course to learn at least the fundamentals of the method before attempting to treat patients.

Some of our physicians are now prescribing *ultrasound* as a method of treatment. The term "ultrasound" refers to those vibrations of sound waves which have a frequency above the hearing range of the human ear, that is, above 20,000 v.p.s. Not until the vibrations exceed 100,000 per second, however, do the unique properties of ultrasound appear. These properties are most noted clinically at a frequency of approximately one megacycle and may be related as follows: (1) energy absorption and heating at the interface between two substances of different acoustic impedances; (2) complete reflection at the interface if the critical angle is exceeded; (3) travel in straight lines; (4) exhibit interference phenomena; and (5) are refracted.

The apparatus itself is simple. It consists of a high frequency generator and an ultrasound transmitter. The generator produces an alternating electric current of the desired frequency, close to one million cycles per second. This high frequency, when applied to a quartz crystal of certain physical characteristics, will generate mechanical vibrations in the crystal by means of the piezoelectric effect. The crystal and its electrodes are enclosed in a light metal case, called a transducer or sound head. The transducer is so constructed that the ultrasound waves are emitted only from the transmitter plate or face.

The success of ultrasonic treatment depends upon careful attention to the details of treatment.[4] The determination of proper dosage is

unsatisfactory. Clinically, the subjective sensation of pain is the practical method of estimating limits of dosage. For effective treatment, more accurate procedures for determining dosage must be employed. It should be realized that the dosage indicated on the instrument panel fails to furnish an accurate index of the actual amount of energy applied or absorbed; it merely indicates the energy available at the sound head.

Regardless of the technic, the best results will be obtained by those who select cases carefully, employ accurate dosage, and pay careful attention to all details of treatment. Again, it is important to take the time to learn the technic properly before attempting treatment. In many places the doctors who wish their physical therapists to use ultrasound are teaching them the method to be used.

The teaching of *glossopharyngeal breathing* is also a recent contribution to our severely involved respiratory patients. An excellent article on this subject was published in the July, 1956, issue of the *Physical Therapy Review*.[5] A small brochure on glossopharyngeal breathing is now available from the National Foundation for Infantile Paralysis.[6]

Electromyography, the study of the intrinsic electrical activity of muscle during rest or activity, is commanding an increasingly important place in the armamentarium of physical therapy devices available for evaluation.[7] Electromyography is a useful aid in diagnosis and is helpful in determining the prognosis in many neuromuscular disorders. The use of electromyography as a procedure aids in planning treatment and provides evidence of progress or lack of it during the course of treatment.

Electromyographic equipment is relatively easy to set up. Reaction of degeneration electrodiagnostic tests may be carried out concurrently with electromyography. These two procedures must be used by thoughtful, skillful, and patient personnel. Thorough instruction in the use of equipment is basic and necessary before a therapist should be allowed to proceed or to be considered qualified to do the work.

Short term courses

Short term courses are being offered so that physical therapists can continue to develop their skills. The practicing physical therapist's responsibility is to take advantage of these opportunities. Generous offers for scholarship assistance and traineeships are available and it is possible that personal investigation can locate additional sources of financial assistance for short course and special course participation. A few national organizations have offered scholarships for special study. During 1954-55 and 1955-56 the Office of Vocational Rehabilitation, Department of Health, Education and Welfare, gave traineeships in physical therapy to faculty members of the physical therapy schools for short term courses in rehabilitation procedures, or for short periods of clinical practice in rehabilitation facilities. It is anticipated that the traineeship program will be extended. Eight approved schools of physical therapy received Federal assistance totaling $36,635 in 1954.[2]

THE CHALLENGE TO THE PROFESSION

There is no single panacea for personnel shortages in the physical therapy field. Much can be done to assure that the best job is accomplished in the light of the shortages and need. Physical therapists have an important place on the rehabilitation team. Rehabilitation implies a totality of approach. We are prepared to accept this and to work effectively with all members of the team. Physical therapists and occupational therapists are bound to work closely together in the best interest of their patients, and are doing so across the country. Thirteen universities have both physical therapy and occupational therapy programs now, and we anticipate establishing an occupational therapy program at Boston University.

Educational programs are strong now. Young people are being prepared to assume responsibility and to carry out effective treatment procedures. Since time and again tremendous responsibility is placed on new graduates, each of us must consider it a personal responsibility to send the schools good candidates, young people who are both academically and personally qualified. Obviously satisfactory scholastic achievement is essential, but people who are personally well qualified for the work are needed. It would be unwise to turn away from a physical therapy school a consistently average student with a remarkable personality. It would be wiser to refuse a gifted student with a personality that all tests show is entirely unsuited for the work. What is needed is a fine combination of scholastic ability and social and personal qualifications which point to fine interpersonal relationships in all areas of the work.

Each has a responsibility to be a sensitive observer and practitioner. The patient must be seen in totality. Physical therapists are qualified by training to carry out treatments according

to prescription; they are the emissaries of the physicians. A college education with the awarding of a baccalaureate degree is little enough to set as an educational standard for members of the medical team. Yet the stimulus of a four year program provides an inspiration to do something which requires thinking and planning. After such a preparation the physical therapist can not accept the role of an automaton but must approach his patients with thoughtfulness and an acuteness to their individual needs. Patients must be treated unselfishly. The doctor has the knowledge for diagnosis and prescription. The physical therapist must demonstrate the ability to treat patients so that they improve in the shortest time possible. He must provide the channels by which patients can acquire a new independence without making the course a despised effort and an endless chore. Physical therapy is enviable in the place it takes in the course of treatment, because often it comes first. Therefore, it is the duty of the physical therapist to use the utmost good judgment in all that he does, to remember his tremendous responsibility as a member of the team, to take up the challenge and do his best to work effectively in the interest of the nation's disabled.

REFERENCES

1. Mobilization and Health Manpower II: A Report of the Subcommittee on Paramedical Personnel in Rehabilitation and Care of the Chronically Ill, Health Resources Advisory Committee, Office of Defense Mobilization, Executive Office Building, Washington, D. C.
2. Release from the Executive Office of the President, Office of Defense Mobilization, Washington, D. C., Feb. 10, 1956.
3. Knott, M. and Voss, D. E.: Proprioceptive Neuromuscular Facilitation, New York, Paul B. Hoeber, Inc., 1956.
4. Miller, F. E. and Weaver, J. B.: Ultrasound therapy, Phys. Ther. Rev., Vol. 34: 11 (November), 1954.
5. Zumwalt, M., Adkins, H. and Affeldt, J. E.: Glossopharyngeal breathing, Phys. Ther. Rev., Vol. 36: 7 (July), 1956.
6. Dail, C. W., Zumwalt, M. and Adkins, H: A Manual of Instruction for Glossopharyngeal Breathing, The National Foundation for Infantile Paralysis, 120 Broadway, New York 5, New York, 1957.
7. Oester, Y. T., Rodriquez, A. A. and Curry, F. V.: The clinical application of electromyography at cook county hospital. Phys. Ther. Rev., Vol. 35: 1 (January), 1955.

Case Report

A Physical Therapy Program for the Postoperative Herniated Nucleus Pulposus Patient

Dorothy Fredrickson, M.A.

The following exercise program is presented as a treatment procedure which has proved very satisfactory to the patient with a low back syndrome and to the physical therapist in this general teaching hospital.

History:

Three years prior to admission, the patient was involved in an automobile accident with subsequent "sore back" and intermittent episodes of low back pain. Seven months before admission, he developed radiating pain down the left leg following the sciatic nerve distribution.

Chief Physical Therapist, Vanderbilt University Hospital, Nashville, Tennessee.

Aug. 6, 1956 Referred to physical therapy for preoperative examination.

Muscle examination: (legs and trunk) Gluteus maximus, hamstrings, gastrocnemius and soleus fair (on left). All other muscle good to normal.

Back: Obliterated lumbar lordosis. No lateral deviation noted.

Gait: Protected weight bearing on left side due to pain. Suggestive of gastrocnemius weakness.

Sensory: Numbness and tingling reported entire left leg; occasional similar symptoms right leg to a lesser degree.

Atrophy: Left thigh circumference ¾ inch less than right; left calf ¼ inch smaller than right.

Joint ranges: Not accurate because of presence of pain. Straight leg raising markedly limited. No trunk flexion, spine "splinted" against movement.

Aug. 7, 1956 Surgery: Laminectomy at level of L5-S1 with excision of intervening disk.

Aug. 9, 1956 Graduated exercises for trunk and lower extremities started as ordered by the physician.

Aug. 10, 1956 Sitting and standing begun.

Aug. 14, 1956 Discharged. Physical therapy examination revealed:

Joint ranges: Straight leg raising 55-60°. Head to knees (straight leg) lacks 10 inches.

Sensory: No pain or numbness noted.

Muscle power: Remained essentially the same.

Gait: No limp.

Sept. 6, 1956 First outpatient visit:

Muscle examination: All muscles Good to Normal except gastrocnemius—Good—.

Joint ranges: Straight leg raising 90° left and right. Able to touch head to flexed knees.

Gait and back: Negative.

Sept. 27, 1956 Outpatient notation: "Patient is pain free and his only complaint is fatigue. Good flexibility of spine. No spasm. Patient is doing exercise 3-4 times weekly. Checked by physician today and to return to his office in three months. Physical therapy discontinued."

A TYPICAL TREATMENT PROGRAM

Treatment includes exercises in the immediate postoperative phase and progresses to full activities. It shows a definite sequence in the exercise program and is specific but allows modification to fit the needs of the individual patient. Progressions to sitting and standing positions are initiated at the physician's request.

First postoperative day

Supine: Head flexion (for abdominal tone).
Assisted hip flexion and resisted extension, bilateral.
Hip abduction and adduction.
Thigh supported, knee extension and resisted flexion.
Gluteal and quadriceps setting and foot exercises by patient several times a day.
Deep breathing.
Side: Hip abduction, assisted.

Second postoperative day

Supine: As above with gradually increasing resistance.
Head flexion plus partial trunk flexion, avoiding flexion of the low dorsal and lumbar spine.
Active exercises for any weak muscles as indicated on the muscle examination.

Third postoperative day

Supine: As above.
Pelvic tilt.
Gentle hamstring stretching.
Prone: Scapular adduction.
Assisted hip extension.
Erector spinae contraction.

Fourth or fifth postoperative day

Back, side, prone: as above, gradually increasing resistance and range of motion.
Sitting: Posture correction.
Resisted knee extension.
Standing: Posture correction.
Tip toe position.
Bed to chair walking.

Fifth or sixth postoperative day

As above.
Gait training.
Bathroom privileges.
Sitting: Trunk flexion as tolerated.

Sixth or seventh postoperative day

Instruction and demonstration of proper body mechanics in functional activities such as pushing and lifting.
Home program is reviewed with patient, omitting the early simpler exercises.
Patient is usually instructed by the physician to remain on limited activity until first outpatient visit.

On discharge: Patient is given follow-up appointment, usually within three weeks for the physician and the physical therapy outpatient clinic. Recheck muscle examination is done at that time and the home exercise program is revised stressing posture in functional activities. Two or three follow-up clinic appointments are considered sufficient if the patient has been cooperative and understands the purpose of the exercise program.

COMMENTS

1. The exercise program itself is short and simple and can be done daily at home without an additional person to assist in giving the exercises.
2. To the supervisors responsible for a large staff and/or a student training program this offers excellent training in recognizing and recording mild to severe symptoms such as sensory and motor disturbances, gait pattern, and scoliosis.

Index to Current Literature

ARTHRITIS

Who Treats Arthritis. Council on Foods and Nutrition, J. Am. M. Ass., 163: 942-943, Mar. 16, 1957

Current Views on Pathogenesis and Therapy of Rheumatic Fever. Combined Staff Clinics of the College of Physicians and Surgeons, Columbia University, and the Presbyterian Hospital, New York, Am. J. Med., 22: 422-436, March 1957

Early Recognition of Rheumatoid Disease with Comments on Treatment. Robert D. Gauchat and Charles D. May, Pediatrics, 19: 672-679, April 1957

Long-term Results in Early Cases of Rheumatoid Arthritis Treated with Either Cortisone or Aspirin. Report by Joint Committee of the Medical Research Council and Nuffield Foundation, Brit. M. J., 5023: 847-850, Apr. 13, 1957

CEREBRAL PALSY

A Study of the Manual Dexterity and Workshop Wages of Thirty-Nine Cerebral Palsied Trainees. A. Jean Ayres, Am. J. Phys. M., 36: 6-10, February 1957

Hereditary Cerebral Palsy. Johanna Blumel, E. Burke Evans, and G. W. N. Eggers, J. Pediat., S. Louis, 50: 454-458, April 1957

Ophthalmologic Findings in Children with Cerebral Palsy. W. P. Schachat, H. M. Wallace, M. Palmer and B. Slater, Pediatrics, 19: 623-628, April 1957

Repeated Psychometric Evaluations of Preschool Children with Cerebral Palsy. K. L. Logan, Pediatrics, 19: 619-633, April 1957

EDUCATION

Evaluation in Professional Education. Percival M. Symonds, Nurs. Outlook, 5: 166-168, March 1957

Medicine and the Liberal Arts. Adolph W. Schmidt, J. M. Educ., 32: 255-262, April 1957

The Evaluation of Students by Their Peers. Walter G. Klopfer, J. M. Educ., 32: 278-281, April 1957

ELECTROTHERAPY AND ELECTRODIAGNOSIS

Electromyography and Electric Stimulation of Nerves in Diseases of Motor Unit. Lee M. Eaton and Edward H. Lambert, J. Am. M. Ass., 163: 1117-1124, Mar. 30, 1957

The Effect of Ultrasonic Energy on Osteogenic Sarcoma: An Experimental Study. J. M. Janes, D. C. Dahlin, J. F. Herrick, and G. M. Higgins, Arch. Phys. M., 38: 148-156, March 1957

Treatment of Paralyses with Exponentially Progressive Currents. Harald Thom, Brit. J. Phys. M., 20: 49-56, March 1957

HEART AND CIRCULATION

Cardiovascular and Pulmonary Physiology. Burgess L. Gordon, Dis. Chest, 31: 371-374, April 1957

Cardiovascular Effects of Breathing Against Unbalanced Atmospheric Pressures. T. F. McGuire and G. D. Talbott, J. Am. M. Ass., 163: 1209-1213, Apr. 6, 1957

Effect of Thyroid Hormone on Circulation. H. M. Thomas, J. Am. M. Ass., 163: 337-340, Feb. 2, 1957

Evaluation of Physiological Functions After Mitral Commissurotomy. G. P. Shafiroff and Q. Y. Kau, N. York State. J. M., 57: 1052-1068, Mar. 15, 1957

Lumbar Sympathectomy in the Treatment of Peripheral Vascular Disease. L. T. Palumbo, G. W. Gray and M. A. Claman, A. M. A. Arch. Surg., 74: 596-601, April 1957

New Approaches in the Treatment of Thrombosis. K. Sigg, Angiology, 8: 44-59, February 1957

Rheumatic Heart Disease in Pregnant Women. Irvin M. Buck, Am. Practitioner, 8: 400, March 1957

NEUROANATOMY, NEUROPHYSIOLOGY & NEUROLOGY

A Graphic Method for Evaluation of Parkinsonian Patients Under Treatment. D. Fairman and R. S. Schwab, J. Am. Geriat. Soc., 4: 1240-1245, December 1956

Compression of Median Nerve in Carpal Tunnel and Its Relation to Acroparaesthesiae. H. Garland, J. P. P. Bradshaw and J. M. P. Clark, Brit. M. J., 5021: 730-734, Mar. 30, 1957

Rehabilitation of the Aphasic Patient. M. Marks, M. Taylor, and H. Rusk, Arch. Phys. M., 38: 219-226, April 1957

Role of the Department of Rehabilitation in the Preoperative Evaluation of Parkinsonian Patients. Zofia Laszewski, J. Am. Geriat. Soc., 4: 1280-1284, December 1956

The Anatomy of Phrenic Nerve Termination and the Motor Innervation of the Diaphragm. G. S. Muller Botha, Thorax, Lond., 12: 50-56, March 1957

The Cervical Sympathetic Ganglia. R. F. Becker and J. A. Grunt, Anat. Rec., 127: 1-14, January 1957

The Dynamics of Swallowing. I. Normal Pharyngeal Mechanisms. M. Atkinson, P. Kramer, S. M. Wyman, and F. J. Ingelfinger, J. Clin. Invest., 36: 581-588, April 1957

The Dynamics of Swallowing. II. Neuromuscular Dysphagia of Pharynx. P. Kramer, M. Atkinson, S. M. Wyman, and F. J. Ingelfinger, J. Clin. Invest., 36: 589-595, April 1957

Treatment of Paralysis Agitans with Orphenadrine (Disipal) Hydrochloride. L. J. Doshay and K. Constable, J. Am. M. Ass., 163: 1352-1357, Apr. 13, 1957

ORTHOPEDICS

Aneurysmal Bone Cysts of Spine. J. W. Beeler, C. H. Helman and J. A. Campbell, J. Am. M. Ass., 163: 914-917, Mar. 16, 1957

Bilateral Rupture of the Quadriceps Tendon. J. F. Hinkamp and R. J. Pellicore, A. M. A. Arch. Surg., 74: 562-564, April 1957

Fractures of the Elbow and Forearm in Children. J. S. Neviaser, J. Nat. M. Ass., 49: 80-86, March 1957

Fractures of the Tibial Shaft. S. F. Morehead and O. Aiken Mays, South. M. J., 50: 289-293, March 1957

Heel Spur (Calcaneal Spur). Henri L. DuVries, A. M. A. Arch. Surg., 74: 536-542, April 1957

The Painful Foot. J. F. Drew, Med. J. Australia, 1: 239-244, Feb. 23, 1957

The Proximal Fibula: Indications for Excision and Use. R. A. Murray and H. H. Brindley, South. M. J., 50: 297-302, March 1957

PARAPLEGIA

Paraplegic Pressure Sores. J. T. O'Hanlan, Virginia M. Month., March 1957

The Neurogenic Bladder in Spinal Cord Injury. David Swartz and Earl Stephenson, Canad. M. Ass. J., 76: 462-465, Mar. 15, 1957

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Suggestions from the Field

Weight Cabinet

Gudrun Tandberg, B.S.

Figure 1 shows a front view of a weight cabinet for an Elgin Exercise Table. The top and bottom sections are closed storage cupboards with sliding doors while the portion between is open and at varying widths to accommodate the size of equipment to be stored.

Each open shelf is slanted except the top one (see fig. 2) which is used for storing the metal collars and spreader handles. The purpose of the slanting shelves is to hold the heavy weights thereby preventing injury to patients or personnel. The pegs permit the placement of weights according to diameter.

Director of Physical Therapy, King County Hospital System, Seattle, Washington.

This is the second of several innovations in physical therapy equipment from the King County Hospital which will be described by Miss Tandberg.

The author wishes to express appreciation to these members of the King County Hospital Staff—to Miss Marylou Ingram for her help with the drawing of the illustrations, and to Mrs. Pearl Rohr for her assistance with the taking of the photographs.

Figure 3. Slanted shelves support the weights. Slanted pegs segregate the weights for easy accessibility.

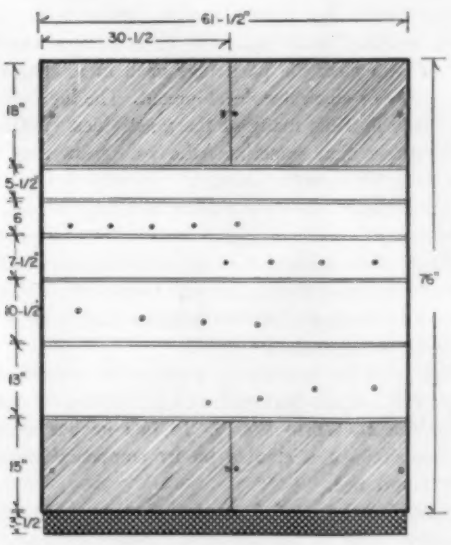


Figure 1.

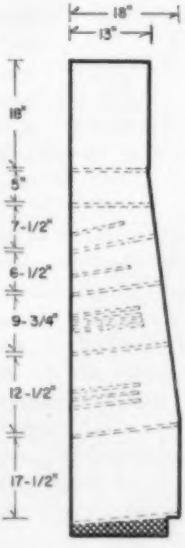


Figure 2.

Editorial

Charles LeRoy Lowman

Charles LeRoy Lowman, M.D., founder and first chief of staff of Orthopædic Hospital, Los Angeles, on June 13, 1957, celebrated his fiftieth anniversary of medical practice. To this friend of physical therapy who has had no small part in the growth of the field, warm congratulations.

Soon after receiving his medical degree from the University of Southern California in 1907, Dr. Lowman journeyed to Boston for postgraduate study. There, at the suggestion of Dr. Robert Osgood, he studied to become an orthopedic surgeon and came under the influence of the early school which included pioneers such as Drs. Lovett, Goldthwaite and Thorndike. He returned to Los Angeles to find himself the only practicing orthopedist between New Orleans and San Francisco. When perplexing problems arose, he and his colleagues in these two cities conferred with each other by mail.

From the first Dr. Lowman was determined to be not just a bone and joint surgeon, but to devote himself to the total care of the whole child. His basic philosophy was to see that each patient had the opportunity to develop his body, mind, and character.

Dr. Lowman's warmly human element is well expressed in his lasting concern for the emotional and social aspects of patient care. Child and teen-age patients were encouraged in supervised activities, such as social clubs, drama groups, music appreciation courses, and even in wheel chair dancing. Each patient was led to join an activity to help meet his particular need in relation to his posture, balance, poise or character development. The loyal assistance of volunteers made possible many of these activities. With a twinkle, Dr. Lowman admits that sometimes the volunteers were helped almost as much as they helped the patients.

Largely through his efforts while working on a California State Committee, legislation was passed in the late twenties which approved the teaching of handicapped children in hospitals and at home, and ensured their transportation to and from school. Under this State Law, school attendance of handicapped pupils grew rapidly from less than 50 to more than 10,000.

Indication of his interest in physical therapy was displayed as early as 1917, when he conducted a training course for physical therapists during World War I. In fact he has always considered preventive orthopedics carried on by competent physical therapists of high importance.

Interested in all facets of physical therapy, treatment of the paralyzed patient became his special concern. The possible values of treatment in warm water for patients having poliomyelitis and

Editorial

other paralyses challenged him. In the mid-twenties, with the help of Susan G. Roen he worked out a definite procedure and to demonstrate the technics showed a film at the American Orthopædic Association meeting in Atlanta, Georgia.

He went on to present a paper on therapeutic pool work at the World Congress of the International Society for the Welfare of Cripples, in 1929, at Geneva, Switzerland; he showed a colored film on pool work at the American Medical Association Meeting in Atlantic City in 1934. His first textbook on the subject, *Technique of Underwater Gymnastics*, written in collaboration with three physical therapists, Susan G. Roen, Ruth Aust, and Helen Paull, appeared in 1937.

His interest in pool treatment never waned. The National Foundation for Infantile Paralysis assisted in the publication of Dr. Lowman's teaching manual in 1952, and had a miniature steel pool constructed for demonstration at the 1951 American Medical Association meeting. General interest was so great that Dr. Lowman again demonstrated the pool that same year at the Second International Poliomyelitis Conference in Copenhagen. In 1955 the National Foundation for Infantile Paralysis assisted in the publication of Dr. Lowman's teaching manual.

As Medical Director of Curriculum in the School of Physical Therapy of the University of Southern California, Dr. Lowman has served the profession of physical therapy well and with sustained interest. The Orthopædic Hospital physical therapists have taken an active part in local, state and national affairs of the American Physical Therapy Association. Therapists who trained under Dr. Lowman are to be found in leading positions all over the United States.

Dr. Lowman, always holding to the worth of physical therapy, served on the important After Effects Committee of the National Foundation for Infantile Paralysis until the late forties. At that time postgraduate courses on poliomyelitis under a grant from the National Foundation for Infantile Paralysis were initiated at Orthopædic Hospital. The courses were attended by physicians, nurses, physical therapists, occupational therapists, and social service workers. The key role played by the physical therapy department served especially to help previously uninterested doctors to understand something of the art and practice of physical therapy. As a natural chain result, hospitals were helped in broadening their physical therapy departments.

In 1936 a gold medal of honor, bearing the insignia of the American Physical Therapy Association, was presented to Dr. Lowman "in recognition of his loyalty to and championship of the standards and ideals of the Association and in deep appreciation of the time and knowledge he so generously gave toward the furtherance of the organization." Another token of regard from the Southern California Chapter of the Association has just been awarded to him. And now, for his Golden Anniversary of Medical Practice, physical therapists appreciation and esteem for a great orthopedist, humanitarian, and friend, are proud to join in whole-hearted Charles LeRoy Lowman.

Association News

Cecelia A. Cummins of Boston, Massachusetts, passed away recently. Miss Cummins received the certificate in physical therapy at Harvard in 1925. She served at Childrens Hospital, Detroit, Michigan, for many years and other positions included Childrens Hospital, Corpus Christi, Texas; and Childrens Hospital, Akron, Ohio. Miss Cummins was awarded Life Membership in the Association in 1956 and was a member of the Massachusetts Chapter.

Chapter News

Colorado

The spring issue of the *High Altitude News*, Colorado Chapter, includes brief biographies of each candidate for chapter offices in order that the entire chapter membership may be prepared to vote by mail. News of chapter members relates interesting items from 23 Colorado members. *High Altitude News* also calls the members' attention to the need for professional liability insurance.

Connecticut

Nutmeg News, April issue, reports an evaluation of the Connecticut physical therapy practice act and annual reports of the chairmen of standing committees. Circulation of the *Nutmeg News* has increased from 214 to 312 this past year.

Illinois

The Spring Issue, Illinois Chapter newsletter, urges members to interest all eligible physical therapists in becoming members of the Association. Also published in the newsletter are four sources of placement service including the newsletter itself and a page of information regarding registration in Illinois, stating that the next examination will be held in October. Total attendance at the Chapter's Educational Workshop held April 27-28 was 138. Out-of-state physical therapists numbered 42 with four states represented.

Indiana Governor Signs Bill

Patricia Holland, Secretary of the Central District, Indiana Chapter, witnesses Governor Harold Handley signing HB396 on Mar. 12, 1957. HB396 is a mandatory law regulating the practice of physical therapy in Indiana.

Michigan—Western District

A one page form for reporting to the recruitment chairman activities carried on by individual members is included in *An After-Thought* published by the district.

Oklahoma

A recent issue of the Oklahoma Chapter presented "bouquets" to Mildred Elson and Mary Haskell as retiring and present Executive Directors of the APTA. As a chapter program an anatomy review using cadavers was held at the University of Oklahoma Medical School. The review was followed by a session on muscle testing. "Coming and Going" presents new chapter members and departed friends.

Texas

The April newsletter announces the names of nine new chapter members. The Chapter project on creation of a library of Kodachrome slides

depicting physical therapy continues with presentation of the slides at the Future Nurses Association convention in San Antonio and at the State meeting held in Dallas.

Marriages

Joan Altherr, of Homewood, Ill., now Mrs. Joan A. Haigh, Chicago, Ill.
Lt. Betty Bates, of Quincy, Mass., to Lt. Thomas B. McCord, Centerville, Tenn.
Suzanne Beresford, of San Francisco, Calif., to Fredric A. Fullington, Denver, Colo.
Idora M. Bickel, of Los Angeles, Calif., now Mrs. Idora B. Meier, Glendale, Calif.
Ruth Clements, of Denver, Colo., now Mrs. Ruth C. Di Domenico, Seattle, Wash.
Arreta I. Edmonds, of Aurora, Ill., to Robert Wesby, Aurora.
Jean L. Fellows, of Pittsburgh, Pa., to Robert H. Forest, Pittsburgh.
Lois Geraci, of LaSalle, Ill., to Frank Colmone, Jr., Chicago, Ill.
Patsy A. Gibson, of Grand Rapids, Mich., to Jack A. Krause, San Carlos, Calif.
Eleanor Hammond, of Tacoma, Wash., to G. Grant Wilcox, Vashon, Wash.
Ellen Harris, of Louisville, Ky., now Mrs. Ellen H. Ackerman, Louisville.
Lucia A. Heeks, of Wallingford, Conn., to L. H. Jordhamo, Bridgeport, Conn.
Elizabeth Heuser, of Fishersville, Va., now Mrs. Elizabeth H. Latham, Haymarket, Va.
Rosemary Kelly, of Maplewood, Mo., now Mrs. Rosemary K. Richardson, St. Louis, Mo.
Emma Ligresti, of Brooklyn, N. Y., now Mrs. Emma L. Chiesa, No. Arlington, N. J.
Geraldine Lindner, of Milwaukee, Wis., to Thomas Lango, Milwaukee.
Robin E. Mitchell, of New Haven, Conn., now Mrs. Robin M. Wilson, East Hartford, Conn.
Edith M. Petty, of Chicago, Ill., now Mrs. Edith P. Cunliffe, Chicago.
Joan Phillips, of Lowell, Mass., now Mrs. Joan P. Ford, Allston, Mass.
Ruth W. Reed, of Durham, N.C., to Robert D. Kehoe, Princeton, N. J.
Carolyn Reincke, of Winnetka, Ill., to Allan F. Sittnick, Lakewood, Ohio.
Florence S. Roberts, of Arlington, Calif., now Mrs. Florence R. Carlquist, Arlington.
Lt. Sharon Sander, of Parks AFB, Calif., now Lt. Sharon S. Scheihing, Parks AFB.
Virginia L. Schenkelberger, of Cambridge, Mass., to Donald T. Devine, Brookline, Mass.
Alma Schroeder, of Oxnard, Calif., to L. S. Laws, Camarillo, Calif.
Lila S. Shepard, of San Diego, Calif., to Donald F. Barcome, San Diego.
Mary A. Udovich, of Chisholm, Minn., now Mrs. Mary U. Malensek, Chisholm.
Jeanne T. Unbehaun, of Cleveland, Ohio, to Harry Whitson, Cleveland.
Carmen Uribe, of Bogota, Colombia, now Mrs. Carmen U. de Villaquiram, Bogota.
Virginia Vau Bree, of Chicago, Ill., now Mrs. Virginia V. Feiler, Chicago.
Pamela A. Worssam, of Riverside, Conn., to Charles D. Harless, Peoria, Ill.

New Physical Therapy Legislation in Florida

Chapter 486, Florida Statutes, 1951, has been repealed with passage of a new physical therapy practice act. It is now unlawful in the state of Florida for any person who is not registered or whose registration has been suspended or revoked, to state directly or imply in any way through use of initials, orally, in writing, by print or by sign that he is a physical therapist. Reciprocity will be granted to those who have passed an examination before a similar lawfully authorized examining board in physical therapy of another state, District of Columbia, territory, or foreign country. United States citizenship is a requirement for registration.

APTA Advisory Council Meeting

The Association's Advisory Council met with members of the Board of Directors and National Office Staff in Philadelphia on May 4, 1957. Advisory Council members attending the meeting were Thomas F. Hines, M. D., Assistant Professor of Medicine, Physical Medicine and Rehabilitation, Yale University School of Medicine, New Haven, Connecticut; Wesley G. Hutchinson, Ph.D., Dean, School of Auxiliary Medical Services, University of Pennsylvania, Philadelphia, Pennsylvania; Charles U. Letourneau, M.D., Director, Program in Hospital Administration, Northwestern University, Chicago, Illinois; and A. R. Shands, Jr., M.D. Medical Director, Alfred I. du Pont Institute, Wilmington, Delaware.

The Advisory Council was informed of the organizational and financial structure of the Association and their guidance was asked on the development of the Physical Therapy Fund, Inc., the legal aspects of physical therapy, interprofessional relations, and planning for mass casualties.

Many helpful suggestions were given by the Council in answer to the Association's requests. These will be discussed further and their implementation considered during the Board of Directors annual meeting to be held in Detroit, June 20-22, 1957.

Omission

The name of Ernest Fischer, M.D., Research Professor of Physiology, Medical College of Virginia, was omitted from "Our Book Reviewers for May." We regret the oversight in failing to acknowledge Dr. Fischer's comprehensive evaluation of the book, *Regeneration in the Central Nervous System.*

EDNA GOLDWATER

New Recruitment Consultant

Edna Goldwater joined the National Office staff on April 15, 1957, replacing Elizabeth MacAuley who resigned on February 28, 1957. Miss Goldwater, a graduate of New York University, brings to the Association a variety of experience connected with public relations and publicity work. She has adapted research material on nutrition, causes and treatment of juvenile delinquency, treatment of disturbed children for motion picture scripts, publicity campaigns, television, lectures, and articles.

In her most recent position with Victor Weingarten, Public Relations Counsel, Miss Goldwater assisted in the planning and execution of public relations campaigns conducted by leading health and welfare organizations. Media utilized in these campaigns included press, magazines, radio, television, motion pictures, and professional publications. Miss Goldwater's previous experience also includes the preparation of informational brochures and fund-raising materials.

Serving the Association through the Department of Professional Education, Miss Goldwater will work directly with the chapter and district recruitment chairmen assisting them with their recruitment projects and public relations activities.

Letter to the Editor

THE NATIONAL ASSOCIATION FOR PHYSIOTHERAPY
IN ISRAEL
c/o Mrs. M. Hirschberg, MCSP
(Teacher's Diploma)
35 Rabbi Street, Ramat Gan, Israel

5th May 1957

The Editor,
The Physical Therapy Review
1790 Broadway (Room 310)
New York 19, New York, U.S.A.

DEAR MADAM:

I would like to comment on one of the articles in the Student Section of your March issue, entitled:

"Israeli Student of Physical Therapy at N.Y.U."

Physiotherapy is far from unknown here in Israel. The National Association for Physiotherapy in Israel, with a membership of about 140, is a member of the World Confederation for Physical Therapy. We have a school with a three year curriculum. There is a chair in Physical Medicine at the Hebrew University Jerusalem, and nearly every Hospital or Clinic of any size has an active Physiotherapy Department.

I believe I can claim that the standard of Physiotherapy here is by no means lower than that of other member-countries of the World Confederation.

One more small point: the collective settlement is usually referred to as "Kibbutz" which is a transliteration of the Hebrew name.

Yours truly,

Signed: M. HIRSCHBERG

Preparation for Parenthood

The Fourth Annual Conference on Preparation for Parenthood will be held at the University of Southern California, August 22-25, 1957. Lectures and demonstrations will include "Relation of Position to Comfort and Complications in Labor and Delivery," "Problems of the Childbirth Training Instructor," demonstrations of teaching abdominal breathing, pelvis rock, body mechanics for the pregnant woman, and relaxation. Those interested in further information should write to:

Mary Jane Hungerford, Ph.D.
Assistant Director, Department of Education
American Institute of Family Relations
5287 Sunset Boulevard
Los Angeles 27, California

Advisory Committee on Chapter Activities

The third meeting of the Advisory Committee on Chapter Activities (advisory to the Chapter and Membership Department) met in the National Office, New York City, February 28-March 2, 1957.

All members of the Committee were present: Sarah Bassett, Massachusetts Chapter; Helen Blood, Utah Chapter; Katherine Chilcote, Colorado Chapter; Wayne Perdue, Nebraska Chapter; Barbara White, D.C. Chapter, Chairman. We were glad to welcome Miss Blood and Mr. Perdue as the two new members of the Committee, and to have Miss Haskell and Miss Voss attend all sessions.

An innovation this year was that two sessions of this meeting were held jointly with the Advisory Committee to the Department of Professional Services. Many items discussed were of mutual interest to both committees. The hope was expressed that in the future it would be possible for these two committees to hold joint sessions with the Advisory Committee to the Department of Professional Education, as the group felt that joint discussions would yield unified action toward accomplishment of the Association's goals and priority projects.

One of the main purposes of the Advisory Committee on Chapter activities is to give assistance to chapters; therefore, problems submitted by the chapters were given first and careful consideration. The Committee's recommendations and suggestions are submitted directly to the chapter requesting assistance.

Other items discussed are of concern to all members and their chapters. Although no attempt is made here to report these discussions fully, some of the main items considered are noted.

Legislation. The Committee feels strongly that it is the professional responsibility of members of the Association to comply with the legislative requirements in those states having licensure or legal registration for physical therapists.

Physical Therapists Trained in Other Countries. Every chapter, district, and member should be thoroughly familiar with the requirements for membership in the APTA which physical therapists trained in other countries must meet to earn APTA membership. This is necessary in order that we as members, our chapters, and our National Office Staff can be of the greatest possible help to those coming to our country to study and work. If you are not familiar with these requirements, request them from the National Office, discuss them at your chapter meetings, and publicize them through your chapter newsletters.

Chapter Educational Programs. Good programs are one of the greatest stimulants for member interest. The Committee was pleased to have Dorothy Voss report on the encouraging trends in long-range planning of chapter and district programs and greater member participation in programs. The chapters and districts should have continued support and encouragement in developing chapter programs.

Chapter Bylaws. The Committee was disturbed to know that six chapters have not revised their Bylaws since the National Bylaws were amended in 1954. They are to be contacted again with reminders of the resolution passed in 1955 by the House of Delegates which relates to Chapter conduct and suspension of charters.

Manual on Chapter Organization. There is encouraging evidence that the Manual has been put to greater and more effective use this past year. Those of you who have attended well organized meetings (especially business meetings) will, we feel, agree with the Committee that it should have even wider usage.

You will recall that it was sent to the chapters in its present form, a draft, in the knowledge that revisions, following a year or two of use, were expected. Already there are numerous suggestions for revisions and additional ones will be requested from the chapters and districts within the year. If you have not done so, try using it this year and give Dorothy Voss your considered opinion of the parts you have found most useful as well as those sections you feel need revision.

Articles By Members in the Physical Therapy Review. The *Review* Board would like to receive more articles by members. The Committee felt that many of the members are doing work which would lend itself to original articles for publication.

The Committee suggested the possibility of developing a competition among chapters—the chapters to encourage members to present material for chapter programs that later could be submitted for publication.

Recruitment Materials. Much good recruitment material is available and much good work has been done. More needs to be done. A new recruitment consultant has been appointed to the National Office staff. The Committee suggested that in addition to the materials now available,

recruitment materials should be prepared for Junior High School students and parents.

Chapter Workshop at the Annual Conference. The workshops held in the past (it has not been possible to hold them the last two years) were considered very successful. The Committee recommended that another be considered for Seattle in 1958. Watch for announcements in the *Review*.

Chapter Exhibits. Preparing, transporting, and exhibiting by chapters at the Annual Conference are expensive. The Committee felt that funds and exhibits could be used by the chapters locally to greater advantage in publicity and promotion work. It was suggested that an exhibit of chapter newsletters be prepared for display at the Annual Conference—the display to include cost of publication and how costs are defrayed.

Chapter Participation in Community Health Planning Activities. Chapter participation in community planning for better local health programs should be encouraged. There is confusion on the part of chapters as to organizational (chapter) participation and the participation of members as individuals—not representing the chapter. Every opportunity should be taken to clarify this and to encourage chapters to participate in these community activities.

Inactive Membership Status. Surprising as it seems, bona fide Inactive Members of the APTA are still being confused with members holding Active membership status who are not actively participating members in chapter affairs. Please review your National and Chapter Bylaws.

AHA-APTA Institute for Physical Therapists. Reports of those who have attended AHA Institutes have been most enthusiastic regarding the information presented. The next Institute is to be held in Boston in the fall. Be on the lookout for announcements which will be mailed to you and for notices in the *Review*.

Special Institutes (AHA and OVR) and Chapter Program Planning. The Committee felt that materials presented at these Institutes have great benefit for all physical therapists. If a member of your chapter has attended any of them, think about including him in your program planning for another year and ask him to share the information he received.

The above are representative of the items discussed by the Advisory Committee on Chapter Activities. Dorothy Voss, Consultant, Chapter and Membership Department; Barbara White, Chairman; and the members of the Committee invite your suggestions and comments. The objective of the Committee is *more effective functioning of our component chapters.* If we can be of help to you, let us know.

BARBARA C. WHITE, *Chairman*

Code of Ethics

Question and Answer

The Code of Ethics, Article III, Section 3, states that "statements concerning the patient's prognosis shall be made only by the physician in charge." What should the physical therapist do when questioned by a relative or friend of a patient or by the patient himself concerning his prognosis?

It is axiomatic that in accepting the physician's referral of a patient for physical therapy, the physical therapist receives the physician's prescription. The prescription usually includes some statement of goals or objectives for the patient and discussion with the physician of goals and procedures to be used is at all times desirable and is mandatory if these guideposts are not included with the prescription. Goals to be attained by the patient are partially based on the physician's prognosis for the patient. The physical therapist's understanding of the physician's prognosis will influence the therapist's attempts to encourage and motivate the patient.

It is the responsibility of the physical therapist to encourage the patient without giving him a prognosis. To do this effectively the therapist must be objective. One of the best ways to accomplish this is by measuring progress. Graphs kept on various activities, muscle tests, joint range of motion, and charts measuring progress in activities of daily living, are most helpful in showing a patient that he is improving. This will give him courage to go on without giving him a specific prognosis. If the patient is not showing progress which can be measured and recorded, the therapist must find other means of urging the patient to persevere with his treatment. This will vary with each patient and the therapist can discover the way to do this only by evaluating the patient, his mental attitude toward his problem, and the treatment program.

Reports of the patient's progress to the physician may result in the physician's redefinement of the goals previously established. A redefinement of goals with a changing emphasis in treatment will again enable the physical therapist to

encourage the patient in line with the new goals. The therapist might point out to the patient that he is maintaining his present functional level, preventing deformities, or delaying regression. An inexperienced young therapist may find this difficult at first but as he gains experience he will be able to encourage the patient without implying that the treatment will result in greater progress than is insured by the physician's prognosis.

Judicial Committee

AMERICAN PHYSICAL THERAPY ASSOCIATION

Marquette University School of Medicine Curriculum in Physical Therapy

One of the newest schools of Physical Therapy,* Marquette University graduated its first class of physical therapists in June, 1956. Bachelor of science degrees in physical therapy were awarded to 14 seniors. In June 1957, an additional 18 graduates will enter the profession.

Marquette's history is one of a cooperative venture with the community. The 75-year-old Jesuit university is located within walking distance of downtown Milwaukee. Its administrators, from a vantage point at the heart of the city, have always been sensitive to community needs.

Today, more than 10,000 students are enrolled in the university's schools and colleges of liberal arts, business administration, journalism, engineering, nursing, speech, law, medicine, dentistry, and the graduate school.

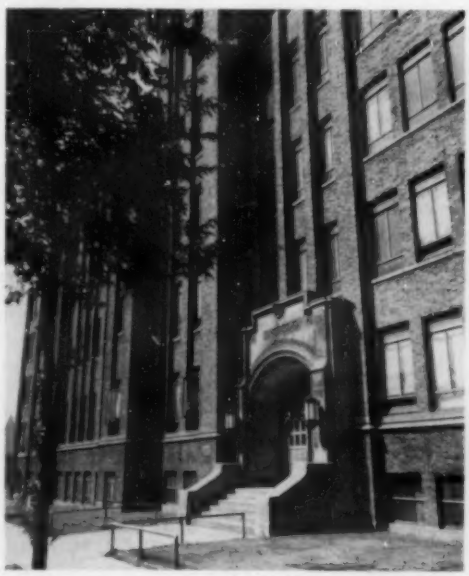
They attend classes on a downtown campus, close to the hospitals, courts, schools, and industries where many will practice their chosen professions after graduation. Extra-curricular activities include more than 100 social, professional and honor societies, seven student publications, all-university band and chorus, varsity debate, drama, and intercollegiate and intramural athletics. The university has its own ski site in the Milwaukee area.

Marquette's initial contribution of 14 trained therapists to the medical profession in a cooperative venture with the community marks but one phase of a more comprehensive program developed in response to community needs.

The physical therapy curriculum developed as a result of a threefold plan recommended to the University by the Community Welfare Council of Milwaukee after a survey of the social welfare and health services in the county.

In 1951, through a bequest from the John G. Thompson estate, a Department of Physical Medicine and Rehabilitation was established at Marquette's Medical school under the direction of Dr. Ray Piaskoski. In 1952, a four year curriculum in physical therapy was established. Miss Beth Phillips is the educational administrator of this program.

Seventy-six students were enrolled in the physical therapy program during the 1955-56 school year. This year's enrollment is 83. The University is prepared to train 20 additional physical therapists each year, both men and women. A graduate program is open to qualified therapists who wish to prepare for training and supervisory positions.



Marquette University School of Medicine

* The Physical Therapy Curriculum of the Marquette University School of Medicine was approved by the Council on Medical Education and Hospitals of the American Medical Association in June 1956.

Undergraduates begin their studies in the College of Liberal Arts where they spend two years developing a broad intellectual and cultural background for their professional studies. As Juniors, they enter the Medical school and are introduced to physical therapy procedures while concentrating on the basic sciences.

Seniors continue their study of technics, adding courses in clinical medicine and surgery, rehabilitation, and administration. The senior year is divided between class work and clinical practice.

The clinical facilities of Milwaukee County General Hospital, Veterans Administration Hospital, Curative Workshop, Frederick J. Gaenslen School, St. Luke's, Columbia, Milwaukee, and Children's Hospitals provide for supervised experience.

Marquette's program in physical therapy is another chapter in the 75-year-old history of service rendered by the University to its community.

Index to Current Literature

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The Treatment of Hydronephrosis by Sacral Rhizotomy in Paraplegics. John A. Hutch, J. Urol., Balt., 77: 123-134, March 1957

PEDIATRICS

Hyperkinetic Behavior Syndrome in Children. M. W. Lanfer and E. Denhoff, J. Pediat., S. Louis, 50: 463-474, April 1957

Recent Advances in the Management of Renal Disease in Children. Part II. Chronic Renal Failure. W. W. McCrory, Pediatrics, 19: 639-650, April 1957

Studies in Respiratory Physiology in the Newborn Infant. III. Measurements of Mechanics of Respiration. C. D. Cook, J. M. Sutherland, S. Segal, R. B. Cherry, J. Mead, M. B. McIlroy, and C. A. Smith, J. Clin. Invest., 36: 440-448, March 1957

The Outlook for Children with Congenital Aortic Stenosis. I. B. Braverman and S. Gibson, Am. Heart J., 53: 487-493, April 1957

The Pediatrician's Responsibility to Handicapped Children. Samuel M. Wishik, Pennsylvania M. J., 60: 377-379, March 1957

PHYSICAL MEDICINE

Rehabilitation Problems of the Aging and Chronically Ill. Corbett Reedy, Virginia M. Month., 84: 187-189, April 1957

The Use of Films in Physical Medicine and Rehabilitation. Francis Bach, Brit. J. Phys. M., 20: 56-58, March 1957

PSYCHOLOGY AND PSYCHIATRY

Emotional Aspects of Chronic Physical Disability. Edward M. Litin, Arch. Phys. M., 38: 139-142, March 1957

The Psychiatrist and Rehabilitation. John C. Nemiah, Arch. Phys. M., 38: 143-147, March 1957

PULMONARY DISEASE

Dead Space Rebreathing Tube for Prevention of Atelectasis. S. I. Schwartz, W. A. Dale and H. Rahn, J. Am. M. Ass., 163: 1248-1251, Apr. 6, 1957

The Fate of the Residual Pleural Space Following Small Resections for Pulmonary Tuberculosis. W. Weisel, R. F. Thimmig and R. R. Watson, J. Thorac. Surg., 33: 390-398, March 1957

The Results of Pulmonary Resection in the Treatment of Tuberculosis. J. C. Cooley, F. H. Moser and G. A. Hedberg, J. Thorac. Surg., 33: 383-389, March 1957

RESPIRATION

A Convenient Method for Measuring Ventilation. F. C. Waring and J. K. Siemsen, Am. Rev. Tuberc., 75: 303-318, February 1957

Antifoam Agents in Pulmonary Edema. R. C. Balagot, R. M. Reyes, and M. S. Sadove, J. Am. M. Ass., 163: 630-633, Feb. 23, 1957

Respiratory Factors Affecting Pulmonary Arterial Blood Pressure and Flow through the Lungs. D. F. Heiman, S. Rodbard, A. B. Shaffer, and G. L. Snider, J. Appl. Physiol., 10: 31-36, January 1957

THERAPEUTIC EXERCISE

Active Motion Devices in Physical Medicine. R. Mazet and H. J. Hogan, Arch. Phys. M., 38: 165-168, March 1957

Effect of Brief Manual Exercise on the Strength of the Quadriceps Femoris. D. L. Rose, S. F. Radzyminski and R. R. Beatty, Arch. Phys. M., 38: 157-164, March 1957

The Anthropology of Posture. Gordon W. Hewes, Scient. Am., 196: 123-132, February 1957

The Treatment of Squints by Exercise. P. D. Trevor-Roper, Brit. J. Phys. M., 20: 58-62. March 1957

MISCELLANEOUS

Acne Vulgaris. R. M. B. MacKenna, Lancet, Lond., 272: 169-170, Jan. 26, 1957

A Job Satisfaction Survey. M. E. Pickens and M. Toyback, Nurs. Outlook, 5: 157-159, March 1957

A Regional Plan of Integrated Medical Services for Handicapped Children. Esther B. Clark, Pediatrics, 19: 685-687, April 1957

Scanning Systems and Data Processing Applied to Biological Physics. Walter E. Tolles, Am. J. Phys. M., 36: 11-15, February 1957

Sequelae to Cold Injury in One Hundred Patients. J. R. Blair, R. Schatzki and K. D. Orr, J. Am. M. Ass., 163: 1203-1208, Apr. 6, 1957

Solar Dermatitis. J. H. Lamb, P. E. Jones and T. B. Maxwell, A. M. A. Arch. Derm., 75: 171-180, February 1957

Some Clinical Observations in Problems of Soft Tissue Calcification. H. Relton McCarrol, A. M. A. Arch. Surg., 74: 578-589, April 1957

The Common Ulcers of the Leg. Aldo Castellani, J. Trop. M. Hyg., Lond., 60: 55-62, March 1957

Therapy of Severely Burned Patients. C. R. Hitchcock and S. Horowitz, A. M. A. Arch. Surg., 74: 485-499, April 1957

Treatment of Headache. A. P. Friedman and H. H. Merritt, J. Am. M. Ass., 163: 1111-1116, Mar. 30, 1957

The Sauna Bath. History, Development and Physiological Effects. Marliese Ly Lehtmets, Am. J. Phys. M., February 1957

Student Column

A Footrest for "Quad" Exercises

Richard C. Pembrook

Resistive exercises for the quadriceps are easier to administer with some kind of support for the foot which eliminates the pull on the leg caused by the weight of the boot. Such a support aids in changing the weights and in attaching the boot to the patient's foot. Resting the boot on the support allows the patient to relax more completely between bouts of exercise.

The height of the footrest is adjustable. The dimensions of the rest can be adjusted for use with both children and adults. It can also be varied to the height of the plinth or chair on which the patient sits.

The footrest consists of a base made of planed-down two by fours, a foot support with two uprights that slide up and down in the base, and a pair of carriage bolts that pass through holes in the base at different levels on the foot support, thus locking the support at the desired height. One inch lumber is used for the bottom and ends of the base and for the top and sides of the foot support. A piece of galvanized iron sheeting over the top of the foot support will protect it from wear.

The author of this "Suggestion from the Field" is a Senior at the University of Minnesota, where the footrest was used by the physical therapy class in connection with a quadriceps exercise experiment.

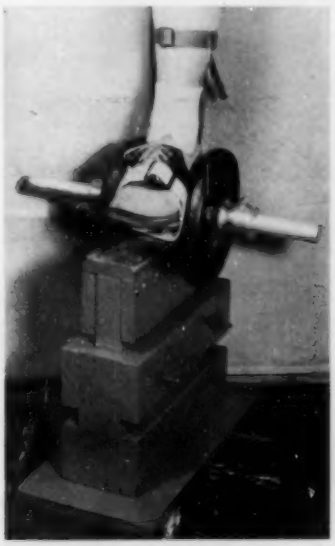


Figure 1. The footrest in use.

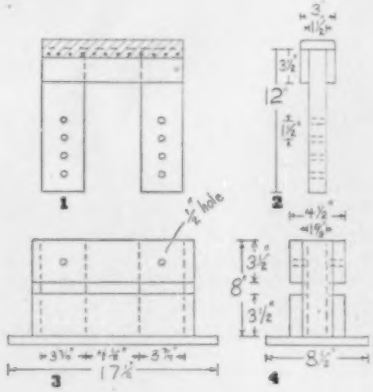


Figure 2.

1. Side view of the foot support.
2. End view of the foot support.
3. Side view of the base.
4. End view of the base.

C.M.E. Students and Staff Recruit in Earnest

A large scrapbook was a feature exhibit along with ultrasound and diathermy equipment on a physical therapy promotion trip conducted recently by the School of Physical Therapy of the College of Medical Evangelists located in Loma Linda, California. The scrapbook, which is about 6 inches thick, with plywood covers, measures 102 inches in length when opened. It includes pictures from the C.M.E. School, career information and many illustrations of physical therapists at study and at work.

The recruitment team consisted of four

students: William Dalton, president of the past year's class; Maria Triantifilo, from Bolivia; Ralph Alway and James Wilhem. With one of the instructors they made a week long trip of 1,500 miles visiting 9 schools, including Pacific Union College. Over 1,500 persons were contacted, and the visitors met with a very favorable response wherever they went.

The programs were conducted not only to acquaint the students with the C.M.E. School of Physical Therapy, but also to tell of general opportunities for a career in the physical therapy profession. At each stop, practical demonstrations were performed, and instructions were given in posture training; it was explained and pointed out how young people in school can prevent such postural defects as kyphosis, lordosis, and scoliosis.

In addition, similar recruiting groups will have visited at least 10 more schools by the end of the school year.

Russel Youngberg, M.D., a resident in physical medicine at the College of Medical Evangelists also has taken an active part in the recruitment program, visiting schools in Arizona and Texas in the interests of physical therapy.

During the spring months, R. William Berdan, former Physical Therapy Director, visited 9 Seventh-Day Adventist colleges around the United States to acquaint the deans and vocational counselors of these colleges with the opportunities and advantages of physical therapy as a career for young people. He also spoke to the student body at each college in the interest of physical therapy training.

ALTON LIBBY
College of Medical Evangelists

EDITOR'S NOTE: Does your school match the above program in scope and effort?

Suggestions for Summer Recruiting Activity

1. Camera Enthusiasts!

If you enjoy taking pictures, and there is a physical therapy department in a hospital or center near you . . . visit the facility and ask permission to take action photos of the therapists at work. If you get a sizeable number, you might make up a small exhibit, prepare proper captions for the pictures, and interest one of the local store owners in displaying the exhibit in his window.

These and other photos of physical therapists in *action* are always needed by the APTA. If you have any good ones, send them along to the National Office. (Hint—be sure that the APTA arm patch is visible and that the therapists' postures and technics are good.) You will have to obtain signed releases from patients when they are in the pictures.

2. Open House

Arrange to put on a short demonstration with the staff showing some of the procedures and modalities used in physical therapy. Local physical therapy departments may be willing to have an open house if you can assure the staff that a number of high school or college students would stop by.

3. Talks and Demonstrations

Contact local scouting, church, and civic youth organizations and ask if you may talk to their young people about physical therapy as a career. Write to "1790 Broadway" for "how-to" materials and for literature to distribute to people attending the meetings.

Research in Homemaking by the Handicapped at the University of Connecticut

At a recent meeting of the student branch of the APTA, University of Connecticut students had the pleasure of hearing a handicapped homemaker give some inside tips on problems of the handicapped housewife. The speaker, Mrs. Neva Waggoner, of Storrs, is research coordinator of this University's School of Home Economics research project, "Work Simplification in the Area of Child Care for Physically Handicapped Women."

Residents throughout the state have been interviewed and a movie is currently in production. The department has done extensive work in clothing. Unrecognized by many, much clothing, particularly that chosen for infants and young children, is unsuitable for the handicapped homemaker; for that matter, much of it is unwieldy even for the normal housewife. Therefore, the department has designed and constructed articles for test purposes and has put these items to use in actual home situations. Great care has been taken in their design in order that beauty and appeal may be retained—and the results have been amazing. Suggestions include many non-

wrinkling fabrics, and large buttons have replaced bothersome tiny ones.

The work in Child Development and Family Relations has been concerned with the adaptation of nursery equipment to suit the special needs of handicapped mothers and the study of play activities that may be supervised by mothers with physical limitations.

Research in the Home Management department is concerned with such problems as the operation of a household from a wheel chair, the management problems of handicapped mothers, and the adaptation of household equipment to suit their particular needs.

A well known homemaker and renowned woman engineer, Mrs. Lillian Gilbreth, of *Cheaper by the Dozen* and *Bells on Their Toes* fame, has been a consultant in the program.

The general feeling at the conclusion of the program was that the evening had been interesting and entertaining, and the students anxiously await completion of the film presently in production.

BARBARA TINDALL, *Class of '58*
University of Connecticut

Hermann Hospital

One course at Hermann Hospital has the students taking over part of the actual presentation of material. Assignments are made to each class member on some phase of poliomyelitis. The student then has the responsibility for doing the necessary "research" on the topic, organizing it, and preparing it for presentation to the class. If applicable, a laboratory practice or demonstration session must accompany the lecture. Answering any and all questions put by the rest of the class presents an opportunity to see if both the "lecturer" and class understand the subject. The best way to understand a subject is to try and explain it to someone else—and this is exactly the learning-by-doing method being used with great success in this one course at Hermann.

JONE STARRING, *Class of '57*

Washington University

A weekly "Junior Conference" has been initiated at Washington University for the junior students at which time problems or questions concerning anything related to physical therapy are discussed. This hour-long meeting consists of student led discussions organized by a rotating committee of three who plan the program. Outside speakers, pamphlets, and films are occasionally used to supplement the discussions. During the past year the topics included studies of the various local and national health agencies and their programs related to the physically handicapped. These informal sessions also permit the students to talk over clinical experiences, course work and to iron out problems as they arise.

LYNN MATHEWS, *Class of '58*

VA Bibliography on Paraplegia Available

Traumatic Paraplegia, a Selected Bibliography compiled by Muriel McKenna, Reference Librarian, Medical and General Reference Library, March 1957, is a 65 page booklet including general, neurological, neurosurgical, internal medicine, general surgical, orthopedic, urological, psychiatric, and psychological aspects of paraplegia. References on decubitus ulcers, social and vocational adjustments, prosthetic appliances and other devices, and physical medicine and rehabilitation are listed as well. Free copies may be obtained by writing to the Chief, Medical and General Reference Library, Room 974, Veterans Administration Central Office, Washington 25, D. C.

Dues Notice

Annual dues were payable on May 1st. Your prompt response will be appreciated as a service to the Association and to insure your uninterrupted receipt of the *Physical Therapy Review* along with other membership privileges. Those who are not actively practicing physical therapy may apply for inactive membership.

Physical Therapy Programs

APPROVED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

Schools offering the four year program leading to a baccalaureate degree accept high school graduates and transfer students. Schools offering the 12 to 16 months' program leading to a certificate accept students who have completed all or most of their undergraduate work providing they meet certain course requirements. Recipients of a degree and/or certificate have equal professional status. For specific information regarding each school's entrance requirements, tuition, and other fees, write to the physical therapy director indicated below. All students should investigate course requirements *early*.

	Degree	*Certificate*
CALIFORNIA		
Mary J. Dodge School of Physical Therapy Childrens Hospital Society 4614 Sunset Boulevard Los Angeles 27	‡	†
Ronald A. Hershey School of Physical Therapy College of Medical Evangelists Loma Linda	†	†
Lucille Daniels Division of Physical Therapy Stanford University Stanford (Palo Alto)	†	†
Margery L. Wagner Curriculum in Physical Therapy University of California The Medical Center San Francisco 22	†	†
Charlotte W. Anderson Department of Physical Therapy University of Southern California University Park Los Angeles 7	†	†
COLORADO		
Dorothy Hoag Curriculum in Physical Therapy University of Colorado Medical School Denver 20	†	†
CONNECTICUT		
Frances Tappan School of Physical Therapy U 101 University of Connecticut Storrs	†	
ILLINOIS		
Elizabeth C. Wood Course in Physical Therapy Northwestern University Medical School 303 East Chicago Avenue Chicago 11	†	†
IOWA		
Olive C. Farr Physical Therapy State University of Iowa Hospitals Iowa City		†
KANSAS		
Ruth G. Monteith Section of Physical Therapy University of Kansas Medical Center Kansas City 12	†	†
LOUISIANA		
Isadore Brown, Acting School of Physical Therapy Charity Hospital of Louisiana New Orleans 12		†
MASSACHUSETTS		
Adelaide L. McGarrett Physical Therapy Department Boston University Sargent College 6 Everett Street Cambridge 38	†	†
Constance K. Greene Department of Physical Therapy *Bouve-Boston School, Tufts University Medford 55	†	
Shirley M. Cogland *Program in Physical Therapy Simmons College-Children's Hospital 300 Longwood Avenue Boston 15	†	†
MICHIGAN		
Virginia Wilson Curriculum in Physical Therapy University of Michigan University Hospital Ann Arbor	†	†
MINNESOTA		
Darrell D. Hunt School of Physical Therapy Mayo Clinic Rochester		†
Wilbur L. Moen Course in Physical Therapy University of Minnesota 860 Mayo Memorial Hospital Minneapolis 14	†	

* Accepts women students only.

‡ Baccalaureate degree available from an affiliating college or university.

	Degree	Certificate
MISSOURI		
Sr. M. Imelda, S.S.M. Department of Physical Therapy St. Louis University 1325 South Grand Boulevard St. Louis 4	†	
Beatrice F. Schulz Department of Physical Therapy Washington University School of Medicine 660 So. Kingshighway St. Louis 10	†	
NEW YORK		
Dorothy L. McLaughlin *Division of Physical Therapy The Albany Medical College Albany 8	†	†
Mary E. Callahan Courses for Physical Therapists Columbia University College of Physicians & Surgeons 630 West 168th Street New York 32	†	†
Elizabeth C. Addoms Physical Therapy Curriculum School of Education, New York University Washington Square East New York 3	†	†
Mildred F. Heap Program in Physical Therapy University of Buffalo 2183 Main Street Buffalo 14	†	†
NORTH CAROLINA		
Helen Kaiser Division of Physical Therapy Box 3403, Duke Hospital Durham		†
OHIO		
Robert D. Kruse Course in Physical Therapy Frank E. Bunts Educational Institute 2020 East 93rd Street Cleveland 6		†
Gladys G. Woods School of Physical Therapy Ohio State University University Hospital Columbus	†	†
OKLAHOMA		
Thelma Pedersen School of Physical Therapy University of Oklahoma, Medical Center Oklahoma City 4	†	†

	Degree	Certificate
PENNSYLVANIA		
Dorothy E. Baethke Division of Physical Therapy University of Pennsylvania 205 S. 34th Street Philadelphia 4	†	†
Kathryn Kelley Curriculum in Physical Therapy D. T. Watson School of Physiatrics Leetsdale	‡	†
PUERTO RICO		
(All classes given in Spanish)• Lutgarda V. Piñeiro School of Physical & Occupational Therapy Professional Bldg., 8th Floor Stop 22, Santurce	†	†
TEXAS		
Doris E. Porter Grady Vaughn School of Physical Therapy Baylor University Hospital Dallas 1	†	†
Cecelia J. Lee School of Physical Therapy Hermann Hospital Houston 25	‡	†
Ruby Decker School of Physical Therapy The University of Texas Medical Branch Galveston	†	†
VIRGINIA		
Susanne Hirt School of Physical Therapy Medical College of Virginia Richmond 19	†	
WISCONSIN		
Beth J. Phillips Curriculum in Physical Therapy Marquette University School of Medicine 561 North 15th Street Milwaukee 3	†	
Margaret Kohli Course in Physical Therapy University of Wisconsin Madison 6	†	†
U. S. ARMY MEDICAL SERVICE		
*Physical Therapy Course Army Medical Service School Brooke Army Medical Center Fort Sam Houston, Texas Write to: The Surgeon General Department of the Army Washington 25, D. C. Att.: Personnel Division		†

* Accepts women students only.

‡ Baccalaureate degree available from an affiliating college or university.

Please direct all inquiries regarding tuition, entrance requirements and other specific information to the school and *not* to the American Physical Therapy Association.

Abstracts

Treatment of Tibial Fractures by Multiple Medullary Wire Fixation

Joseph E. Wheeler (VA Hospital, Alexandria, Louisiana), SOUTH. M. J. 50: 294-296, March 1957

A series of cases of fractures of the tibial shaft treated by multiple medullary wires showed this method of treatment to be sound mechanically and physiologically. It further resulted in a decrease in morbidity, disability, and expense.

Of 115 cases of fractures of long bones which had been treated by medullary fixation, 12 of these used multiple wire fixation. In these 12 cases, no nonunion has occurred although some of the cases represented patients previously treated by casts and bone plates with resulting nonunion. In one case, a fracture of the fibula at the malleolus could not be held in position until a medullary wire inserted from below provided immobilization. Another case presented a fracture of the tibia, treated elsewhere with resulting nonunion, shortening and misalinement. An open reduction, with the introduction of 6 large Kirschner wires from the medial side of the tibia, was done. Bowing resulted, necessitating the use of a cast. Finally union was obtained.

Since the wearing of the leg cast had been necessary to overcome bowing and prevent torsion, the next tibial fracture was treated by introducing the wires from both sides of the tibia. Wires, 18 inches long, were used and passed distally into the cancellous bone end attaining satisfactory stabilization without the use of external immobilization.

The operation is done by exposing the fracture site through an anterior incision. A stab incision, 1 inch long is made on both sides of the tibial tubercle through which ⅛ inch holes are fashioned by drill and curette in the cortex of the bone with the bevel pointing distally. Six to 8 wires, 18 inches long are inserted through each hole and driven distally into the canal of the proximal fragment. By using the hooked wire with a flexible pull wire, the introduction of the medullary wires is accomplished. The hooks in the protruding ends of the wires are cut off at the fracture site. The fracture is then reduced and the wires are inserted into the medullary canal of the distal fragment fixing the fragment in the position of complete reduction. The distal ends of the wires are staggered in place by forcing alternate wires ½ inch deeper into the cancellous part of the distal end of the bone. The proximal ends are cut off leaving ½ inch of wire protruding through the holes in the cortex. These ends are then bent and turned beneath the muscle, fascia and skin. After this procedure, the stab incisions are closed.

A posterior leg splint is applied to be kept in place until the wound heals. The patient may walk with crutches, but no weight is placed on this extremity. When union is firm, the wires are removed.

The advantages of this method are as follows: it is a simple procedure, it provides firm support, no casts are necessary, early ambulation is possible, and it is inexpensive.

Tendon Transplantation in Rehabilitation

William T. Green (300 Longwood Avenue, Boston), J. AM. M. ASS., 163: 1235-1240, Apr. 6, 1957

Factors which influence the consideration of and results of surgery for tendon transplantation are the subject of this article.

Tendon transplantation is the only means of providing active motion in areas where paralysis has occurred. Transplantation should be considered if there is loss of a major functional unit, where there are strong muscles available for moving, or if an imbalance is present which interferes with stability and is producing a deformity.

One must consider the total function of the part, and of the patient as a whole, thinking of adjacent joints as well as the one specifically influenced by the transplant. Other factors to be considered are the cause of the muscle weakness, the patient's age, and likelihood of deformity with growth.

Muscles to be transplanted should have a grade of good or better, and should be considered in relation to the new task to be done—for instance three or four of the smaller anterior muscles might need to be transplanted to function adequately for the gastrocnemius-soleus group. The muscles must have sufficient strength to improve function of the part. While strength is one of the major considerations in the lower extremity, the factor of control is more important in the upper extremities. Whenever feasible, the transplanted muscles should have ranges of contraction similar to those of the muscles they are replacing.

Essentially one must think of whether the transplanted muscles will be more important to the total function in their new role than in the original position, weighing carefully the loss which is incurred from their shift. In order to allow for adequate function, and prevent deformity, the strength of the muscle antagonistic to the transplant must be taken into account. The ideal situation is to use a muscle which is deforming, and transplant it to substitute for some weakness.

In general, tendon transplantation should not be undertaken before a child is five years old, in order that he may be adequately trained. However, if delay may lead to increasing deformity which would be difficult to correct, earlier surgery should be performed.

Certain basic principles can always be followed, in spite of the variety of technics employed. A transplant should not be required to work against a contractural deformity. A muscle should have a straight line of contraction from its origin to its new insertion. The tendon should have adequate space to glide easily in its path. Care must be taken not to injure the nerve or blood supply. Bony insertion of the tendon is preferable, although in the upper extremity, tendon to tendon insertion may be the method of choice. Support for the transplant should allow the tendon to be on a slack.

Fundamental principles of postoperative care are outlined. There should be continued support in an overcorrected position. Active exercises may usually be started about the fifth to seventh day after surgery. Motions may be started with the part in a bivalved cast, and working in a small painless range. If, after three weeks, the patient is unable to "find" the transplant, electrical stimulation may be used as an assist. Exercise sessions should be held initially twice daily, then increased to three or four times daily, with an increasing number of motions in each. Resistive exercises should not be instituted less than six weeks postoperatively, and heavy resistance exercises not for at least three months. "A transplant should not be made to work, other than at an exercise period, until it can carry out its motion effectively over a good range." The initial aim is to work toward a good functional range rather than power.

Once the simple motion has been mastered, one can work toward incorporating the transplant into the

functional pattern. This is particularly important in the lower extremity, where the patient must be actively trained to use the transplanted muscle in his gait pattern. In the early stages, the patient should use crutches, so that he can get the feel of using the transplant, but without undue strain. In general it is unwise to use braces for this purpose.

Throughout the postoperative period, special care should be given to the prevention of contractures. Stretching and night support for an extended period are frequently necessary. It is particularly important that some supervision over a long period of time be given to these patients, particularly children.

The Effect of Pain on Performance

F. B. Benjamin (U. S. Naval Air Development Center, Johnsville, Pennsylvania, and the University of Pennsylvania, Philadelphia), U. S. ARMED FORCES M. J., 8: 332-345, March 1957

Medical literature has shown that pain produces certain autonomic responses, is characterized by a certain emotional component, and also acts as a stressor agent. All of these are known to exert an effect on performance.

In this study the author subjected 26 persons to various methods which produced pain. Each subject served as his own control and his performance was analyzed in the presence of pain and without it.

Pain was produced in three ways. In the first method a styrofoam frame was placed around the head just above eye level. Pressure in a plastic tube placed inside this frame was controlled to produce mild pressure pain. During the control test no pressure was applied to the headgear. Secondly, a pressure cuff inflated to 180-200 mm. Hg. was applied to the arm, obstructing the blood flow and causing a deep, aching pain. For the control experiment, although the cuff remained in place, it was not inflated. As the last pain producing mechanism, the hand of the subject was immersed in ice water which caused severe pain after 45 seconds. The same hand was held in water at a temperature of 21 deg.-27 deg. C. for the control investigation.

To determine the effect of pain on performance, a battery of tests designed to measure mental performance, memory, time perception, muscular coordination, reaction time, and reflex activity were applied to each of the subjects. The rate of work performance was also charted as were the respiratory function and the pulse rate.

An analysis of the results shows that pain has little or no effect on memory, speed of performance, and various mental tests. With simple mental tasks the increase in the number of mistakes bore no relation to pain intensity, however with more complex mental activity the number of mistakes increased according to the degree of pain. Simple reaction time remained unchanged but choice reaction time was prolonged. The amplitude of the patellar reflex shows no significant change in the presence of pain. Muscular coordination was decreased as the pain intensity increased, particularly when the task to be performed was of greater refinement. In short tests of work performance, total work done is not changed, but the efficiency of performance is markedly decreased as evidenced by changes in pulse and respiration.

Constructive Hip Surgery with the Vitallium Mold

Otto E. Aufrang (Massachusetts General Hospital, Boston), J. BONE SURG., Am. Vol. 39-A: 237-248, April 1957

In this report by Dr. Aufrang, which concerns the results of 1,000 consecutive hip arthroplasties using the Vitallium mold, he makes note that results labeled excellent, satisfactory, or unsatisfactory are liable to many variables, not the least important of which is the result as viewed by the doctor and viewed again by the patient. From all results, however, there is much to be learned. The arthroplasties evaluated as excellent leave less to learn than those evaluated as merely satisfactory; for in the latter, the points of surgical technic or convalescent care can always be improved upon. The unsatisfactory result offers the greatest area for learning because every detail can be checked and analyzed—complaints of the patient, objective and subjective findings, the source of trouble and its elimination, or recommendation of supplementary surgery if necessary. This last is delayed if any improvement promises to continue.

Much has been found that benefits supplementary surgery; most especially in recognizing that healing of tissues subjected to severe stretching or joint dislocation takes a long time. As a result of this recognition, many muscles are detached from their insertions rather than retracted forcibly from the operating site. The ileopsoas is often reinserted at the anterior-medial-distal aspect of the capsule, affecting more direct pull and preventing the tendon from becoming imbedded between the mold and the acetabulum.

Following surgery, carefully graded exercise programs are set up within pain tolerance. If pain persists, the exercises are reduced or, if necessary, eliminated entirely until they can be tolerated. Only partial weight-bearing is allowed because full weight-bearing too early causes wearing away of healing bone. Motion is secured gradually; support is used as long as there is any soreness or limp. Range of motion is considered more important than strength in the earlier stages.

The cases treated most often are those with bony ankylosis, traumatic or degenerative arthritis, old and fresh fractures of the acetabulum, rheumatoid arthritis, old sepsic hips, and salvage following other hip procedures. Congenital subluxation and congenital dislocation are also candidates for hip arthroplasty. In most of these cases, good to excellent results may be expected if patients are treated according to principles of bone healing and muscle control.

A Study Comparing the Effects of Bed Rest and Physical Activity on Recovery from Pulmonary Tuberculosis

S. Hirsch, R. Schaedler, C. Pierce, and I. Smith (Rockefeller Institute for Medical Research, New York), AM. REV. TUBERC., 75: 359-409, March 1957

During the era prior to chemotherapy, the beneficial effect of bed rest on recovery from tuberculosis was widely accepted. Since the introduction of effective chemotherapy there has been increasing disagreement both in theory and practice concerning the role of bed rest. Some believe that physical inactivity exerts a beneficial effect masked by the superimposed action of antimicrobial agents. Others suspect that the effect of chemotherapy is so marked in comparison with that of bed rest as to render the latter relatively unimportant. Some have speculated that bed rest may be antagonistic to

the optimal action of the antimicrobial drugs. How much bed rest is necessary is of practical importance to patient, physician, and health officials planning for the care of these patients.

This article gives the results of a controlled study on the effects of bed rest and physical activity on the course of recovery from moderately advanced and far advanced pulmonary tuberculosis treated with antimicrobial drugs. Instead of using the usual method of control (treating alternate patients in a different manner) each patient was alternated through periods of bed rest and physical activity and detailed clinical and laboratory observations made to determine whether or not activity caused worsening of, or delay in the clinical progress. Each patient served then as her own control. At first patients were treated with an initial period of bed rest and no patient was placed on activity until she was afebrile. The approach became more liberal as data were collected. The final group was treated with activity or bed rest in a predetermined random fashion with variations in duration and sequence of rest and activity periods.

The 21 patients studied were all adult females with their disease of recent origin. Those on activity were required to be up for 12 hours. During the first week of a shift from bed rest to activity, they were allowed up stepwise increasing 1 to 2 hours a day to the maximum of 12. Weight, temperature, pulse, and respiration were recorded; sputum was collected and weighed.

Physical examination was repeated weekly for pertinent changes. X-ray examinations were repeated at 2 week intervals. Drug therapy included streptomycin sulfate and isoniazid. For initial evaluation and follow up, complete blood counts, sedimentation rate, urinalysis, stool examination, serologic tests for syphilis, C-reactive protein determination, fasting blood sugar, and Middlebrook-Dubos hemolysin test were done.

The discussion in the paper covers all of the laboratory data. The authors point out that they are dealing with relatively short term recovery from tuberculosis. Further study is needed to assess the influence, if any, of physical activity on the incidence of relapse. The over-all results appear good. All patients were brought to a "sputum negative state" and all cavities were closed. However the number of cases is small and the follow up short. There has been to date only 1 confirmed relapse. This patient left the hospital against advice.

Detailed clinical and laboratory observations revealed no detectable deleterious effects of physical activity on the course of recovery in cases of relatively fresh, but moderately advanced or far advanced, pulmonary tuberculosis.

Discussion on the Present Position of Manipulative Treatment

Reginald Watson-Jones, H. A. Burt, Guy Beauchamp and A. T. Richardson. PROC. R. SOC. M., Lond., 50: 137-144, March 1957

The types of cases for manipulations to be considered are five: 1) Mobilization of joints seriously stiff after injury or prolonged immobilization in plaster; 2) joints with local adhesion formation; 3) osteoarthritic joints; 4) joints of spine with adhesions or prolapse of intervertebral disks; 5) for psychological treatment of a patient with functional disorder superimposed on a minor physical disability.

Sir Reginald Watson-Jones expressed the opinion that manipulation of seriously stiff joints gives rise to more stiffness of the joints. Hourly active exercise is the essential treatment, and passive stretching should be eliminated as well as forcible manipulation by the surgeon. He acknowledges the fact that the return of normal range of motion will be slow, taking at times, three to six months; but maintains that manipulated joints have a poorer prognosis because during forcible manipulation there is danger of refracture or tearing of tendon insertions. For adhesions after simple strains of a joint, gentle manipulation under anesthesia may accelerate recovery. However, for degenerative arthritic joints, he feels that a patient should learn the use of a joint within the limit of tolerance of activity and not force it beyond that. In cases of low back pain and prolapsed intervertebral disks, simple bed rest, and a protective corset achieves far greater success than any type of manipulation. In referring to manipulation as an aid to psychological treatment, he considers active suggestion of treatment, but not actually touching the patient, as perhaps the best form possible.

Dr. H. A. Burt confines his remarks to the value of manipulative treatment in the rheumatoid and osteoarthritic and in the frozen shoulder.

Dr. Burt states first, that two erroneous beliefs persist about rheumatoid arthritis: 1) That rheumatoid arthritis "burns itself out" in a year or two, and 2) that it is wrong to manipulate a joint while the disease is active. He replies to these beliefs by admitting that the disease is self-limited in some cases, but that there are other cases in which activity may continue indefinitely. In regard to these long term patients, he feels that delay of manipulation wastes valuable time and with delay, technical difficulties occur, presenting more painful procedures and less good results. The wrist in palmar flexion he considers an absolute indication for manipulation, as well as knees with flexion contracture. For the frozen shoulder, Dr. Burt warns against forced abduction and stresses traction and rotation. His chief indication for manipulating a frozen shoulder is persistent pain or when severe loss of function poses a definite handicap. He feels that manipulation is not indicated in a painless frozen shoulder because movements will steadily return of their own accord.

Dr. Guy Beauchamp presents the position of those who practice manipulations; stating that the orthopedic surgeons approach manipulation against the background of physical therapy and that the osteopaths receive extensive and careful training in the methods of spinal manipulation first introduced by Dr. Andrew Still. Dr. Beauchamp also considers the persons manipulated and points out the fact that this treatment has over the years become an initial treatment and no longer one resorted to after running the gamut of physical therapy. Female predominates over male and the chief complaint was of pain in neck and shoulder girdle. However, the group complaining of pain in the occipito-atlantal and atlanto-axial joints was considered most helped by manipulative treatment. He feels too, that exercise should follow any type of manipulation but that heat and massage have no part in the manipulative treatment.

Dr. A. T. Richardson deals more specifically with conditions of the spine in relation to manipulation. He feels that a condition of replaceable displacements must be diagnosed and that manipulation should be ensured to have the desired effect without any harmful results before the manipulations are indicated. The criteria necessary seem limited in most

cases and in the occasion when pain is related to degenerative changes which is associated by virtue of pressure on spinal cord or nerve roots, manipulation is a risk because there is no way to protect the already damaged cord. With theoretical or psychological factors hard to define, yet where loss of movement occurs and is not restored by mobilizing exercises, it seems indicated to give manipulations. Widespread acceptance of manipulation, however, depends on results. Only one controlled investigation has been carried out—treating patients either by manipulation or by bed rest with a lumbar pillow. In any case of manipulation, however, Dr. Richardson feels that X rays are a necessity, and he concludes that this form of treatment should be more thoroughly investigated and understood before it is hailed with undue enthusiasm. More conservative methods of physical therapy remain the mainstay of treatment of spinal pain.

Hyperventilation Syndromes; Clinical and Physiologic Observations

B. I. Lewis (State University of Iowa, College of Medicine, Iowa City), POSTGRAD. M., 21: 259-271, March 1957

There are two types of hyperventilation syndrome, acute and chronic. The acute syndrome is characterized by dramatic but transitory bouts of hyperpnea culminating in frank tetany. The chronic syndrome presents a puzzling picture strongly suggestive of serious organic disease. It tends to result in prolonged disability.

The syndrome usually has a psychogenic etiology and exhibits a prolonged pattern. There are hyperventilation syndromes which are a direct result of affections of the central nervous system and severe febrile states. The psychogenic hyperventilation syndrome often develops in patients with co-existing organic disease, particularly disorders of the cardiovascular system, over which the patient has become excessively apprehensive.

The clinical features of a hyperventilation syndrome include EEG changes manifesting themselves as disturbances of awareness and peripheral and perioral parasthesias probably due to electrolyte changes. Disturbances of respiration vary from frequent sighing to gross overbreathing. The respiratory difficulties are rarely reported by the patient as the prime difficulty. Cardiovascular complaints of tachycardia, and precardial pain are the symptoms of greatest concern to the patient.

The symptoms are usually brought on by effort, according to the patient. However, on questioning it is revealed that the symptoms begin, after the effort rather than during the exertion. There are data on 150 patients studied.

Laboratory studies done on these patients include carbon-dioxide concentration of alveolar air by the Liston-Becker analysis, respiratory pattern data using a spirometer, electrocardiograph, and arterial blood pH.

The results show increased pulse rate, EKG changes, and pH changes of respiratory alkalosis.

When hyperventilation is suspected in a patient, the diagnosis must be confirmed by reproducing a typical exacerbation by voluntary overbreathing. Classically, the symptoms will appear within the first 60 seconds, during which the maximum fall in CO_2 tension occurs. The full attack requires further hyperventilation but rarely exceeds 3 minutes. Breathing into a paper bag will rapidly increase the CO_2 tension and relieve the symptoms.

The therapeutic program outlined by the author has been effective; 70 per cent of the patients had good results, 20 per cent received partial or temporary relief, and 10 per cent gained little or no relief. This last group were mainly persons with strong depressive or hysterical tendencies.

Disorders of Laughter Due to Brain Lesions

Redvers Ironside (Maida Vale Hospital, London, W.9), BRAIN, Lond., 79: 589-609, December 1956

Various clinical manifestations of disordered laughter are described in an attempt to show that focal lesions in widespread areas of the brain can cause disturbances of emotion and of laughter at different levels. Laughter as an epileptic symptom and its relation to temporal lobe epilepsy is also discussed.

In reviewing natural laughter and smiling, the author points out its two components: (1) the more voluntary phenomena of facial expression in smiling and (2) the more automatic laryngeal and respiratory phenomena in laughing. The laughter response is proportional to the stimulus in degree and duration, and the subjective emotional state of which laughter is the expression is usually, but not always, one of amusement or joy. The bulbar automatisms of laughter are respiratory phenomena adapted to the display of emotional feeling.

Pathological laughter never resembles natural laughter. Either the sounds or facial expressions are intrinsically different, or else the emotion behind the laughter is absent, or so disordered as to render the sounds inappropriate, contradictory, or purposeless. Disordered laughter (or disordered weeping) from brain damage is a clinical curiosity except in cases of pseudobulbar palsy due to cerebral vascular disease, or certain cases of advanced multiple sclerosis. In such cases autopsy usually reveals evidences of bilateral degeneration of corticohypothalamic and corticobulbar tracts. It is to be emphasized that disorders of laughter are more commonly due to diffuse lesions. However, it has been generally accepted that disordered laughter also occurs with discrete brain lesions.

In this study, in order that the localizing value of the lesion or lesions might be assessed, 20 cases of uncomplicated bulbar palsy due to motor neurone disease where lesions were believed to be confined to the motor system were reviewed.

Observations in this study did not refute the commonly accepted view that pathological laughter disorder is most frequent in diseases of both hemispheres interfering with corticohypothalamic and corticobulbar tracts controlling faciorespiratory mechanisms. It was also observed that laughter disorders may occur in uncomplicated bulbar palsy due to motor neurone disease. Single lesions, if appropriately placed, also cause pathological laughter. The frequency of lesions involving the posterior hypothalamus and midbrain is noteworthy in these cases. In the opinion of the author, the role of the hypothalamus has not received sufficient attention. For the production of an emotional response, whether of laughter or of weeping, some degree of integrity of the hypothalamic nuclei seems to be essential. Evidence is presented to show the fallacy of the contention that laughter disorders do not result from pathological lesions situated below the hypothalamic or midbrain level. Lesions of the posterior hypothalamus seem to cause a pathological laughter which is secondary to an excitement of the emotions. The classification as epileptic of more prolonged

fits of laughter, followed by hemiplegia or stupor, seems justifiable on the analogy of the jacksonian attack followed by paralysis, or of the epileptic motor aura followed by unconsciousness.

The author theorizes concerning the functions of various structures of the brain as they are related to emotional states. Disorders of laughter at three levels are described. It is noted that these levels are not clearly defined clinically and that the site of the cerebral lesion is not located by emotional disorder, but rather by the associated somatic findings.

Present Status of Ultrasound in Medicine

Fritz Friedland (17 Hammond Pond Parkway, Chestnut Hill, Massachusetts), J. AM. M. ASS., 163: 799-803, Mar. 9, 1957

Since its introduction into the United States from Europe in 1949, ultrasound has been used as a therapeutic modality in a variety of conditions. There are four general phases of its use in medicine: 1) for experimental laboratory work; 2) in physical therapy as radiant energy; 3) for selective destruction of tissues; and 4) as a tool for diagnosis.

The tremendous number of publications on the topic has not helped to clarify its present position in the field of medicine, but rather to flood the literature with a mass of confusing data. This paper does not attempt to review the literature, but rather to present the highlights of the use of ultrasound in medicine.

Ultrasound is a longitudinal wave, which is not represented in the electromagnetic spectrum, and changes any matter in its path into an oscillating state. It depends on a medium for transmission, and its speed varies with different media, being greatest in solids. The frequency used for medical ultrasound is 800 to 1000 kilocycles per second which is a compromise between the lower frequencies which have better penetrating power, and the higher frequencies which are better for absorbability. The usual means of production is a piezoelectric crystal, charged with a high-voltage, high-frequency current.

The ultrasonic effect on living tissues "is due to mechanical influences of the rhythmically oscillating acoustic energy as well as to heating caused by absorption and conversion of energy." Mechanical damage may result from formation of cavities by liberation of gases.

The difference between destructive and nondestructive treatment depends exclusively on the dosage. The optimal dosage has not been determined, but is judged empirically in any case. Factors to be considered are the intensity of energy transmitted at the sound head, the duration of treatment, and whether the method used is that of a stationary, slightly moving, or massaging sound head. The time of treatment depends on the size of the area to be covered. Any pain or discomfort is an indication of overdosage.

The use of nondestructive ultrasonic therapy has been chiefly in rheumatic, inflammatory, and traumatic disorders of the neuromuscular and musculoskeletal systems. The nature of these conditions makes it difficult to accurately evaluate the efficacy of this agent. According to this author, ultrasound "cannot improve or remedy any conditions that heretofore were not amenable to other forms of treatment." Ultrasound should be considered contraindicated wherever its use would delay the application of any proven therapy.

Destructive doses of ultrasound have been used only experimentally to date. It has been tried as a therapy for cancer, but is not generally acceptable. It has also been used for selective destruction of brain tissue, and for destruction of calculi.

Two technics of using ultrasound for diagnostic purposes are described: the trans-sonation method, and the echo-ranging technic. The latter has been used with some accuracy for diagnosis of benign and malignant breast tumors.

Acute Arthritis in the Adult: Diagnosis and Treatment

M. W. Garry (Milwaukee, Wisconsin), AM. PRACTITIONER, 8: 228-233, February 1957

This paper presents briefly the clinical symptoms of the varied diseases which affect the joint as an acute manifestation. Emphasis is placed on examination and findings as related to the joints per se. General treatment is described. Early diagnosis, although often difficult, is of utmost importance in order that proper therapeutic measures may be initiated. In the opinion of the author much of the difficulty in the diagnosis of these disorders may be attributed to the inadequate clinical examination of the joints. While most physicians carry out essentially the same examination procedure as regards the heart, lungs, or abdomen, no such standard routine has been established for the examination of the joints. A routine which consists of inspection, palpation, passive movements and active movements in order, is suggested.

The treatment of the rheumatic diseases has as its primary objectives the relief of pain, the promotion of rest and relaxation, the maintenance of the vital functions, the prevention of deformities, and the general rehabilitation of the patient.

In *acute specific infectious arthritis* in which bacteria may reach the joint by any of several routes, the extent of the involvement may vary from mild arthralgia to severe suppurative arthritis with marked joint destruction. Early symptoms include chilliness, fever, and polyarticular and migratory pain which becomes restricted to one or more of the larger joints in a few days. The joint becomes red, swollen, and painful. Intramuscular injections of either penicillin or streptomycin for a period of at least 10 days or until the infection has subsided is indicated.

Acute gouty arthritis presents an initial clinical picture of monarticular involvement which is attended by constitutional disturbances. The symptoms are characterized by their sudden onset and the transient nature of the complaints. The disease may progress to involve more than one joint. These joints appear swollen, the skin shiny and dry, and are colored an intense red or violaceous hue. About 50 per cent of the initial attacks involve the first metatarsophalangeal or tarsometatarsal joints but may also be observed in ankle, wrist, hand, or knee. In addition to the use of drugs, bed rest with splinting and protection of the affected joint should be employed.

Approximately 10 per cent of the cases of *rheumatic fever* occur in patients who are over 15 years of age. The onset is marked by a sore throat or upper respiratory infection which subsides and then is followed by the clinical picture of rheumatic fever. Joint involvement proceeds centrifugally and the affected parts become swollen, tender, and painful. During the acute phase bed rest, good nursing care, and an adequate diet are essential. Salicylates are still the treatment of choice.

Rheumatic disease is characterized by an acute onset in 15 per cent of

the patients. The smaller joints of the fingers and toes are first affected and the process moves in a centripetal direction. Involved joints are hot, tender, and painful and synovial effusion is present. Such effusion, if persistent, may lead to residual deformity of the joint which is of diagnostic importance. Bed rest with support of the affected joints is extremely important to these patients. ACTH and cortisone and also salicylates may be effective in the control of the disease.

Reiter's syndrome is another fairly common rheumatic disorder. The triad of clinical findings are urethritis, conjunctivitis, and arthritis. Other diseases described in this article include *infectious uro-arthritis, palindrome rheumatism, intermittent hydroarthrosis, pharmaceutic arthritis*, and the *Schönlein-Henoch syndrome*.

The importance of early and accurate diagnosis with careful attention to the history, physical findings and laboratory testing is stressed. Specific treatment should be instituted as early as possible for attaining best results.

The Case for Ultra Sound

R. R. Beatty (Physical Medicine and Rehabilitation Service, Veterans Administration Hospital, Kansas City, Mo.), SOUTH. M. J., 50: 370-373, March 1957

Although there is sufficient knowledge concerning the physics of ultrasound, there still exists some variance of opinion concerning the clinical applications of ultrasound.

The effects of ultrasound on biologic systems have been summarized as mechanical, thermal, chemical and biologic. Most of the evidence suggests that a large part of the biological phenomena occurring from exposure of living tissue to ultrasound can be explained on the basis of heat production.

Ultrasound has been used in many types of medical conditions, but the author states that we are primarily concerned with its use in periarthritis, fibrositis, tenosynovitis, nonspecific forms of bursitis and myofasciitis, nonparalytic forms of neuritis, painful neuromas in amputation stumps, osteoarthritis, and rheumatoid arthritis. Ultrasound has good beaming effects, it has an efficient transfer of energy to tissue from its source, it penetrates to a good depth, it has a greater absorption in muscle than fat, as well as selective heating effects at boundaries. These qualities make ultrasound superior to microwave in the opinion of this author.

There is still a great deal of controversy concerning the effects obtained by ultrasound, but, as the author states, certain clinical and laboratory studies suggest that ultrasound is a useful addition to physical medicine. These studies, however, are in need of more objective support.

The Immediate Postoperative Complications of Thoracic Surgery in Pulmonary Tuberculosis

David E. Thomas (Fitzsimons Army Hospital, Denver, Colorado), J. THORACIC SURG., 33: 341-349, March 1957

In this article the author has made an analysis of postoperative complications of thoracic surgery in tuberculosis. The advent of excisional surgery has replaced many treatment procedures such as phrenic crush, pneumothorax and extensive thoracoplasties. There is a great deal in the literature concerning postoperative complications, but not many have an extensive analysis of the problem.

Recent literature which was reviewed offered these points: Complications generally occurred in patients with inadequate treatment, unstable disease, inadequate localization of disease, endobronchitis, cavities, positive sputum, salvage cases, and cavities opened at surgery. Complications increased with the magnitude of resection. Operative morbidity and mortality were not prohibitive.

One hundred patients were used in this analysis, most of whom were military personnel and their dependents. Each patient was selected for surgery by a joint Medical-Surgical Board. Those selected included, in general, patients with large caseondose residuals, open or closed cavities, persistently positive sputum, severe tuberculous bronchiectasis, thick pleural peel, or history of reactivation, particularly after prolonged drug therapy. Of these 100 patients 12 were so-called "salvage" cases. One hundred and eighty-two surgical procedures were performed. For this study a complication was considered to be any situation which required re-tubing or re-operation, was life endangering, had serious sequelae, or resulted in death. The most frequent complications were expansion problems, pneumothorax, hydropneumothorax, and hemopneumothorax.

It was found that complications occurred most frequently in patients in these categories: those having segmental resections, or segmental resections plus wedge resections; white males; those in advanced age group, and those with positive sputum at surgery. If the unoperated lung was diseased complications were more frequent, as they were in the salvage cases.

Residual disease in the operated lung, duration of therapy, and tuberculous endobronchitis did not seem to influence the occurrence of complications. Dr. Thomas stressed the human element as responsible for many complications and emphasized the fact that this is an area where improvement can be made.

Shoulder-Hand Syndrome

E. S. Gurdjian and J. E. Webster, J. MICHIGAN M. SOC., 56: 353-355, March 1957

The shoulder-hand syndrome is characterized by a painful shoulder, stiffness, swelling and pain in the hand and fingers, as a result of a reflexed neurovascular dystrophy following diseases of the thorax, head, and neck. This condition may be seen after myocardial infarction. At first, the pain in the extremity is accompanied by stiffness and swelling, eventually there may be atrophy with flexion deformities of the fingers and contractures with osteoporosis in some cases.

The mechanism of production of the shoulder-hand syndrome is on a reflex basis. The afferent stimuli coming from the injured or diseased area in the thorax, neck, or the upper limb activate the internuncial pool in the spinal cord. This then spreads to the anterolateral column stimulating sympathetic cell bodies as well as the cells in the anterior horn. The preganglionic fibers in turn activate the postganglionic fibers supplying the blood vessels of the extremity, resulting in a series of abnormalities; namely, stiffness of joints, swelling, and aching and burning pain in the hands and fingers.

The differential diagnosis of shoulder-hand syndrome includes a consideration of many conditions that result in a painful state in the upper extremity. Some of these are a cervical ruptured or protruded disk, cervical rib and anterior scalene

syndrome, costoclavicular syndrome, causalgia due to nerve injury and local diseases in the upper extremity and the spine, including bursitis and osteoarthritis of the spine and the extremity.

The treatment of the patient with shoulder-hand syndrome is by the use of sympathetic blocks, massage, active and passive movements of the extremity, as well as the development of a healthy viewpoint by the patient toward his disability. When definite disease entities have been found which may be treated by special measures such as sympathectomy, laminectomy, or scalenotomy, these should be carried out.

A Survey of Bone Disease

R. H. Fellis (Washington, D.C.), AM. J. MED., 22: 469-484, March 1957

The author introduces this survey with a review of the normal growth sequences in cartilage and bone, for if such is understood, a satisfactory classification of bone disease can be formulated.

Only those diseases which have been described in man are discussed. They are divided as follows: first, disturbances in the growth of cartilage; second, disturbance in the osteogenic-osteolytic balance; third, disturbance in the deposition of hydroxyapatite in cartilage matrix and/or osteoid.

The first category, of primary interest to the pediatrician, includes the giants and the dwarfs. Hereditary, nutritional, and endocrine factors all play an important role in this group. Since little is known of the metabolic activities which characterize the growth of normal cartilage, there is virtually no understanding of the deranged patterns in these diseases. They are in consequence of disturbances in growth of cartilage and may exhibit increased or decreased growth. Increased growth is of endocrine origin, while decreased activity may be of genetic, physical (radiation), nutritional, or endocrine origin.

The second most important category includes those diseases associated with derangements in the equilibrium between bone formation (osteoblastic activity) and bone destruction (osteolytic activity). Imbalance of these two phenomena leads to bone of increased or decreased density. These changes are described by the terms osteitis fibrosa, osteosclerosis and osteoporosis. These diseases are more likely to come to the attention of the internist.

The last category of bone diseases, of interest to both the pediatrician and the internist, includes those which are the result of "disturbances in the deposition of hydroxyapatite in cartilage matrix and/or osteoid." They are characterized by a decreased content of bone salt (hydroxyapatite) in the matrices of cartilage and bone. The term "rickets" is used to designate the situation in the growing child. In the adult, "osteomalacia" indicates a reduced amount of inorganic material in bone matrix. Diagnosis may be made either chemically or microscopically.

These disturbances may be in excretory function, or metabolic in nature. They may have an anatomic basis or may be due to a disease syndrome, or dietary deficiencies.

Bone is no exception to the dictum that tissue changes are not necessarily specific for a given disease. Despite this, bone biopsy may be of assistance in identifying the nature of some of the complex clinical problems in which the skeleton may be involved.

Relationship Between Clinical Status and Behavior Test Performance in a Newborn Group with Histories Suggesting Aonxia

F. K. Graham, M. M. Pennoyer, B. M. Caldwell, M. Greenman, and A. F. Hartmann (Washington University School of Medicine), J. PEDIAT., S. LOUIS, 50: 177-189, February 1957

The development and standardization of several test procedures designed to assess the behavioral status of newborn infants have been reported in previous papers. In the present paper these tests were administered to a group of 60 "anoxic" infants, including those with observable postnatal anoxia and those with possible prenatal anoxia, and to a group of 62 normal infants.

The five tests consisted of a pain threshold test, a maturation scale, a vision scale, an irritability rating, and a muscle tension rating. For the pain threshold test, the examiner administers a mild electric current to a small area just below each knee. A typical response to this stimulus is a clear, discrete extension of the leg with some flexion of the foot. The examiner observes the infant's behavior under a variety of stimulating conditions such as head and leg reactions when placed in a prone position, leg response to pressure, auditory reaction, response to mildly annoying stimuli such as a small piece of paper or cotton placed above the upper lip or over the nose, strength of grasp, and vigor and persistence of response to several of the items. Scoring of the visual response takes into consideration the presence or absence of certain responses (such as uncoordinated eye movements, fixations, or pursuit), the ease of elicitation, and the direction and the distance through which the eye moves in pursuit of a stimulus. Irritability rating is based on observations made during the administration of the three previously described scales. The purpose of the muscle tension rating is to quantify deviations of muscle tone in the direction of either increased flaccidity or rigidity. This rating is based on observation of the amount of spontaneous movement, the position of the limbs when the infant is in a relaxed state, the frequency of trembling of body parts, and the response to such procedures as limb displacement and being pulled from a supine to a sitting position.

All the tests show satisfactory reliability, and norms have been provided for each of the first five days of life. In the present study the degree of impairment in test performance reflected the seriousness of the clinical condition. Therefore, the behavioral tests appear to provide an objective, quantitative, and sensitive method of assessing the clinical status of a newborn infant.

Treatment of Alopecia Areata with Intradermal Injections of Thiamine Chloride

Hervey A. Foerster (Oklahoma City, Oklahoma), SOUTH M. J., 50: 380-382, March 1957

Alopecia areata is a disease of unknown etiology, but has been considered by some to be of parasitic origin and was reported as epidemic in various localities. It was also thought to be caused by circulatory disturbances or of a nervous origin.

The prognosis of alopecia areata is variable and difficult to predict. It is usually good in young patients and in those without extensive involvement. The disturbance may occur at any time in life, although it is rare before the fifth year. The most frequent period is middle adult life.

Erasmus Wilson, writing in 1840, advocated the use of external irritants whose prime purpose was to stimulate circulation of the affected areas, since he believed the disease

was caused by a circulatory disorder. Since this time, most dermatologists have used irritant therapy, but in 1947 a patient asked the author if there was not some way to bring back the growth of his hair without burning up his scalp with carbolic acid and ultraviolet.

The author favors the neurotrophic theory and advocates a method of treatment using an aqueous solution, thiamine chloride, injected into the skin of the patches. The author used thiamine chloride orally and by intramuscular injection without success, but when large concentrations of the drug were injected directly into the scalp, regrowth of the lost hair did occur.

Effect of Electrotherapy on Some Mechanical Properties of Denervated Muscle

J. D. Thompson (Department of Physiology, University of Iowa, Iowa City, Iowa), AM. J. PHYS. M., 36: 16-20, February 1957

This report is concerned with the effects of electrotherapy on changes in extensibility in denervated rat gastrocnemeii.

The gastrocnemius of one side of the rat was denervated by sciatic section under ether anesthesia. The opposite undenervated, untreated gastrocnemius served as a control. The treatment consisted of the direct application, through needle electrodes, of 30-second bouts of repetitive stimuli at maximum intensity once a day for 14 days. In one group of rats, the denervated gastrocnemius was untreated; in another group it was treated isometrically, the foot in a dorsiflexed position during treatment; in the third group, the muscle was allowed to shorten freely during treatment which was isotonic in nature.

Results showed that the gastrocnemius muscles of the rat, denervated for 14 days, exhibited a marked decreased static extensibility.

Isometrically treated muscle showed less atrophic weight loss and a lesser degree of extensibility loss following denervation than the isotonically treated muscle. Various possibilities as to which muscle components are influenced by electrotherapy, and how they are influenced, are discussed.

Our Abstractors for July

The following Association members have assisted in the preparation of abstracts for this issue:

Margot Trimble	Joan Bissonnette
Dorothy Brasil	Mary E. Sacksteder
Dorothy Briggs	Lois MacTaggart
Olena Cole	Jean Cuthbertson

Book Reviews . . . . .

Bing's Local Diagnosis in Neurological Diseases. *Translated, revised and enlarged from 14th German ed. by Webb Haymaker, M.D., Chief of Neuropathology Section, Armed Forces Institute of Pathology; Associate Professor of Neurology, Georgetown University School of Medicine, Washington, D.C.; Professor, Lecturer in Anatomy George Washington University, School of Medicine, Washington, D.C. Cloth; price $16.75. Pp. 478; illus. C. V. Mosby Co., St. Louis, 1956.*

This reviewer has never before had the unique experience of finding a review already written for him, in the form of a foreword. In this instance, it would be anticlimactic to attempt to add materially to the foreword written by Robert Wartenberg to this already classic reference book on neurological disease. There are easier and less thought taxing ways to spend a quiet weekend. One can only regret the misfortune which prevented access to the first edition of the reference.

The book is divided into several sections, concerned primarily with localization of lesions in the cord, the brain stem, the cranial nerves, the cerebellum, the cortex, the extrapyramidal area, the thalamus, and associated regions. There are also sections on the arterial systems of the brain and syndromes resulting from their occlusion, intracranial tumors, and finally the use of X rays and the electroencephalogram in neurological diagnosis.

The format is excellent, the illustrations simple yet always supplement the text well. One must also point out that it is a pleasure to find the illustrations generally occurring on the same page as the appropriate text, so that one does not have to leaf forward and backward when referring to them. The style is lucid and comfortable when used either as reference for a single point or when the chapter or section is read in its entirety.

It would be quite easy to say that the book is recommended completely for reading by all physical therapists. Practical limitations are evident, however, and restraint must be practiced. The initial seven chapters which are concerned with the function and localization of lesions of the spinal cord is particularly appropriate for all therapists as a practical means of correlating the sometimes uninteresting classroom neurophysiological presentations. The same might and will be said of the chapter concerned with extrapyramidal disorders and that with the arteries of the cerebrum. The remainder of the book is a reference without equal when particular questions arise on specific neurological situations. It is to be hoped that the book may eventually be available to all therapists, students, and graduates, in a nearby if not personal library.

The Physician-Writer's Book. *By Richard M. Hewitt, A.M., M.D. Senior Consultant, Section on Publications, Mayo Clinic; Associate Professor of Medical Literature, Mayo Foundation, Graduate School, University of Minnesota. Cloth; price $9.00. Pp. 415; illus. W. B. Saunders Co., Philadelphia, 1957.*

This book is designed primarily as a manual to assist in the preparation of medical papers, books, articles, and similar material. Although the title specifically limits its use to physicians and although the author repeatedly continues this limitation throughout the text, all scientific writers can certainly find much of value here.

In the plan of the book, the author considers first the whole article or book and then continues to the paragraph, the sentence, and finally words. The latter portion of the book takes up such specifics as illustrations, the mechanics of publication and copy writing, and a dissertation on ethics.

Much of the information set down here is of practical worth for anyone preparing material. It highlights not only the more common errors but provides examples of the way to avoid such errors. Dr. Hewitt's method of using "catch" phrases and descriptive titles tends to emphasize his points and clarify his suggestions for improvement.

There are one or two aspects of

this text which are open to criticism primarily from the point of view of style. Particularly questionable is the practice of using short sections of material as whole chapters. Chapters 1, 14, 18, and 32 each consists of less than one page. The last named is composed of only 67 words arranged in 3 sentences. While such an arrangement may provide emphasis, it might be more practical to incorporate the material into other chapters or to expand it to a reasonable length.

Several places throughout the book the author includes superfluous material of a conversational nature. For example he says, "Here I am tempted to relate an experience of many years ago, . . . But it is better put in Appendix II." A simple reference to its position might have been sufficient.

The use of multiple appendices does permit including a great deal of pertinent and illustrative material Some of the examples clarify Dr. Hewitt's advice with sharpness and humor. Again, however, it might have been more meaningful to have incorporated these in the chapters to which they refer so that they could have been applied by the reader more easily.

Generally anyone interested in writing in the medical field will profit from studying this text. It will make a useful reference addition to the library.

The Adaptation of Recreational Activities for Men in the Rehabilitation of Lower Limb Injuries. *By Veida Barclay, Fellow of the Chartered Society of Physiotherapy; Superintendent of Rehabilitation, Patshull Rehabilitation Centre, Wolverhampton; Part-Time Lecturer, Anstey College of Physical Education. Cloth; price 18s. 6d. net. Pp. 154; illus. G. Bell and Sons, Ltd., London, 1956.*

Although not herself a physical therapist, the author of this interesting book has devoted 14 years to work in the field of rehabilitation, and for this has been awarded a Fellowship of the Chartered Society of Physiotherapy. This book is the outcome of her experiences in adapting sports and other recreational activities and skills to the teaching of specific movements and the correction of specific physical disabilities resulting from injuries to the lower extremity. She states in her preface that the purpose of the book is to show that recreational activities, adapted for remedial purposes, have a definite place in the scheme of rehabilitation after injury. In this she is singularly successful.

The book is well organized and the material is presented in logical progression from the section on Running and Walking, through Vaulting: The Progression of Jumping, Primary to Advanced Games, Cycling, Swimming, and Ballroom and Folk Dancing. All sections are well illustrated by diagrams and photographs and, while geared particularly to the favored British sports, much of the material could be adapted easily for use with the American patient.

Two general chapters follow the technical sections listed above. The first of these outlines the average times at which recreational activities may be started in normal patients following meniscectomy and certain fractures of the long bones of the lower extremity. The second is devoted to the relationship of recreational activities to other methods used in rehabilitation. The author closes with a brief summary of the values and scope of recreational activities when organized as an integral part of a rehabilitation program.

The Patshull Centre presents an ideal situation for the development of therapeutic recreational activities. In the United States, unfortunately, comparable situations now exist only in the large military hospitals. However, the rehabilitation-minded physical therapist will find in Miss Barclay's book much stimulating food for thought.

Postural Drainage. *By E. Winifred Thacker, M.C.S.P., Superintendent Physiotherapist, Harefield Hospital, Middlesex, England. Paper; price 8s. 6d. Pp. 56; illus. Lloyd-Luke Ltd., London, England. 1956.*

This paper bound monograph which is approximately 5 by 7 inches in size should be of extreme interest and most helpful to physicians, nurses, and physical therapists who are working in a thoracic unit or ward. The author has made use of simple phrases, similes, and diagrams accompanied by actual photographs to illustrate principles and goals in the postural treatment of chest conditions. By so doing she has eliminated the necessity for extensive technical knowledge in understanding her presentation. For this reason, I believe, selected patients who are receiving instruction in postural drainage might benefit from reading the monograph and seeing the illustrations.

Miss Thacker, a physical therapist with much experience indicates that with "accurate positioning, good diaphragmatic breathing and correct coughing," patients can be protected from further complications of the chest, can be relieved of many discomforts and sometimes avoid surgery. Further, many are able to return to work with comfort and continue their postural drainage at home.

The author succeeds admirably in presenting the principles of treatment and in their execution in practice. She uses the following analogy to illustrate why a knowledge of the bronchial tree is absolutely necessary. In a case of lung suppuration, the infected area is like a narrow-necked bottle filled with thick oil. The question is how are we going to empty it? The ordinary cough resembles hitting the base of the bottle and jerking some of the contents out. The answer is to invert the bottle with the neck hanging down. This can be done only if the bottle is placed in the proper position. Thus, in order to drain properly secretions from the lungs, a patient must be placed in a position to gain the maximum aid of gravity for the affected area. Too frequently, the "tipping" of the bed with the patient's head hanging down is thought to be sufficient. Miss Thacker proves otherwise.

This monograph is highly recommended to those working with thoracic conditions. Not only is the technic of postural drainage given but also the following topics are included: an anatomy and physiology of the respiratory system with symptoms following pathological changes, pre- and postoperative treatment, the technic of breathing combined with coughing including precautions and special problems which one may encounter in working with young children, the aged and grossly emphysematous patients.

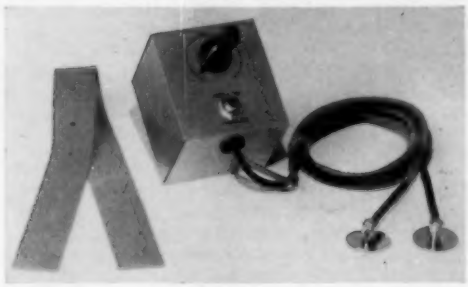
As indicated by the writer, success is dependent not alone on an understanding of principles but also upon proper technic in carrying out the treatments which require perseverance, understanding and the cooperation of both patient and therapist.

The reviews here published have been prepared by competent authorities and do not represent the opinions of the American Physical Therapy Association.

(Please turn to page 454 for our book reviewers for July.)

What's New . . . . . .

70. Muscle Stimulator



Waters—MS-11 Muscle Stimulator is specially designed for home use. The manufacturer states that for the first time here is an inexpensive, simple-to-operate but effective muscle stimulator. It may be prescribed for home treatment under the direction of a physician for patients recovering from certain nerve injuries or diseases. In brief the stimulator operates by producing a manually interrupted direct (galvanic) current stimulating impulse. The Waters Corporation.

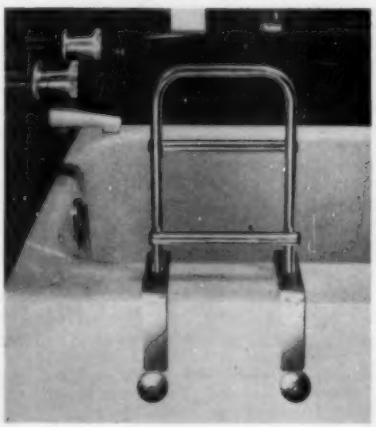
71. Cover for Wet Pack

"Thermo Pac" is simply an envelope type cover made of six (6) layers each, top and bottom, with a tie tape flap to be used in conjunction with the hydrocollator wet packs. "Thermo Pac" saves time and saves on laundry costs. "Thermo Pac" is now available for immediate delivery. Sherman Mills.

For more information on items write to The Physical Therapy Review, 1790 Broadway, New York 19, N. Y.

New items which may be of interest to physical therapists will be mentioned in these pages each month. The accompanying explanations are made by the manufacturers and have not been investigated by the *Physical Therapy Review*.

72. Safety Bathtub Grip



The Self Ease Safety Bathtub Grip with its three levels affords hand-hold security and banishes fear of falling when getting into or out of a bathtub. This device eliminates the need for costly, custom-made, built-in bars, which require expensive installation into bathroom wall tile-work.

The Self Ease Grip is constructed of rugged, 16-gauge steel tubing supporting, in tests, over 2,000 pounds pull-thrust with ease. The entire unit has heavy-duty chrome plate finish. Model "S" is used for bathtubs whose tub wall rim measures *up to* 5-inch thickness, and Model "L" for 5-inch and over tub rim widths. Self Ease Units, Inc.

Classified WANT-ADS

WATERBURY, CONN.: Three therapists for expanding department, some outpatient cerebral palsy and polio work. Wide variety of cases. Medical director is a physiatrist. Excellent working conditions and personnel policies. Forty-hour week, salaries open. Contact Miss Katherine A. O'Connell, R.N., R.P.T., Waterbury Hospital, Waterbury, Conn.

EXCELLENT physical therapist position available immediately. Top salary. Contact at once if interested. United Cerebral Palsy Clinic of Orange County, 2473 South Orange Blossom Trail, Orlando, Florida.

WANTED: STAFF physical therapist—member of the APTA and/or ARPT; for 350-bed fully accredited hospital. Located on beautiful Long Island Sound, one hour from New York City. Apply Personnel Department, Norwalk Hospital, Norwalk, Connecticut.

QUALIFIED PHYSICAL THERAPIST, male or female, to head department in outpatient rehabilitation unit connected with University Medical Center. Position available for late fall with opening of new building. Salary open, depending upon experience. Contact: Executive Director, Medical Center Rehabilitation Unit, University of North Dakota, Grand Forks, North Dakota.

STAFF PHYSICAL THERAPIST, either experienced or inexperienced. Excellent working conditions, 37½-hour work week. Good personnel policies, good medical supervision. Beginning salary for experienced physical therapist $4,000. Crossroads Rehabilitation Center has recently moved into a new modern completely equipped plant rated as the finest in the nation. If you are cooperative, pleasant to work with and interested in the future please apply, Roy E. Patton, Executive Director, 3242 Sutherland Ave., Indianapolis, Ind.

PHYSICAL THERAPIST: In Hospital-School for rehabilitation of children with orthopedic handicaps. Complete interesting program. Good salary, merit increases. Annual paid vacation, sick leave, excellent retirement plan. Write to Richard Eddy, Superintendent, Illinois Children's Hospital-School, 2551 N. Clark, Chicago 14, Illinois.

Physical therapist for STAFF POSITION in outpatient rehabilitation clinic. Liberal benefits, air-conditioned clinic, modern equipment and under direction of a physiatrist. Recent graduate acceptable. Write: Ward A. Merrell, Administrator, Rehabilitation Services, Inc., 200 Court Street, Binghamton, New York.

WANTED: MALE OR FEMALE

Qualified physical therapist; staff or supervisory; for fully accredited, general hospital; 285 beds and also outpatients. Forty-four (44) hour week, 5½ days per week. Laundry and uniforms furnished. Liberal employee benefits. Salary open with annual increments. Expansion program provides excellent advancement potential. Contact: Mrs. Hilda Manieri Traina, Director of Physical Therapy, Petersburg General Hospital, Petersburg, Virginia.

QUALIFIED THERAPIST for outpatient rehabilitation center. Salary commensurate with experience. Contact Dr. Eugene Moskowitz, Director, Mobility, 427 Main Street, New Rochelle, New York.

PHYSICAL THERAPIST: Some experience in cerebral palsy work to set up a Cerebral Palsy Treatment Center in 325-bed general hospital. Also to assist in general physical therapy duties in established department. Basic salary $4,500 a year. Adjustments depend on experience. Write: Miss Mary Reilly, R.N., Trumbull Memorial Hospital, 1350 E. Market St., Warren, Ohio.

HARRISONBURG, VIRGINIA: Qualified physical therapist for 190-bed general hospital with active department averaging 20 patients per day. Good equipment. Pleasant atmosphere. Salary open. Contact J. N. Liskey, Administrator, Rockingham Memorial Hospital.

Physical Therapist, STAFF POSITION, male or female Salary commensurate with experience. Five-day week, liberal vacation, holiday and sick leave. Social Security. Apply Personnel Director, Crotched Mountain Rehabilitation Center for Children, Greenfield, N. H.

SILVER SPRING, MARYLAND. Physical therapist to work with cerebral palsied children in day center adjacent to Washington, D.C. Salary commensurate with experience. Five-day week, 35 hours, month vacation, Social Security, legal holidays and sick leave. Address United Cerebral Palsy Nursery-Treatment Center, P.O. Box 187, Silver Spring, Md.

IMMEDIATE PLACEMENT for qualified staff physical therapist in 335-bed general hospital, well equipped department serving both in- and outpatients; 40-hour week, paid vacations and sick leave. Write Administrator, Lima Memorial Hospital, Lima, Ohio.

Qualified physical therapist wanted for 100-bed hospital. Salary $4,800. Vacation, sick leave, and Blue Cross policy. For further information write: St. Joseph's Hospital, Alliance, Nebraska.

Physical therapist for STAFF or SUPERVISING position in VNA, providing generalized service. Well established treatment center, standard salary commensurate with experience. Forty-hour week, 4 weeks' vacation, 7 paid holidays. Apply Director Visiting Nurse Association, 218 E. Market St., York, Penna.

SUPERVISOR: Physical therapist needed to head physical therapy department in a progressive, 263-bed psychiatric hospital, suburban Boston, Division of Massachusetts General Hospital. Opportunity for experience in the rehabilitation of patients with emotional as well as physical disabilities. Five-day week. Good employee benefits including 4-week vacation and pension plan. Salary open. Write qualifications to Vera Kilstein, Personnel Director, McLean Hospital, Waverly, Mass.

Classified WANT-ADS

QUALIFIED PHYSICAL THERAPIST for staff position in a 320-bed hospital. Completely remodeled and well equipped department, wide variety of cases divided equally between hospital and outpatient. Forty-hour week, paid vacation, sick leave, and holidays; salary open depending upon qualifications and experience. Excellent opportunity in a growing community located in the Valley of the Sun, winter capitol of the Southwest. Apply Personnel Director, Good Samaritan Hospital, Phoenix, Arizona.

WANTED: QUALIFIED MALE or FEMALE physical therapist for 700-bed hospital. Full PM & R Program. Good salary; vacation and sick leave; retirement plan. Contact Herman J. Bearzy, M.D., Miami Valley Hospital, Dayton, Ohio.

NEW YORK CITY 650-bed general hospital. Excellent oppty qualified P.T. Modern expanding dept. Liberal personnel benefits include 4 weeks' vacation, 11 paid holidays, Blue Cross, life insurance. Personnel, Montefiore Hospital, 210 St. & Bainbridge Ave., Bronx 67, N. Y.

PHYSICAL THERAPIST: To work in cerebral palsy treatment center. Fully equipped, comprehensive program. Excellent medical supervision, good salary, liberal personnel policies. Scholarship available for preliminary training if desired. Write Dr. H. L. Rudolph, 400 North Fifth Street, Reading, Pennsylvania.

Physical Therapist for active, well equipped department in teaching hospital affiliated with Northwestern University. Pleasant living in residential, lake-shore suburb just north of Chicago. Forty-hour week, three-week vacation, good salary. Apply: Personnel Director, Evanston Hospital, 2650 Ridge Avenue, Evanston, Illinois.

STAFF physical therapist wanted in an expanding general rehabilitation center in Midwest. Starting salary $3600 with quarterly increments of $100 to $5,000. Hospitalization, 2 weeks' vacation, 1¼ days per month sick leave, accumulative to 90 days. Address: K. W. Keever, M.D., Medical Director, Magnetic Springs Foundation, Magnetic Springs, Ohio.

GROWING DEPARTMENT in 350-bed general hospital needs qualified female therapist. Beautiful modern hospital with well equipped P.T. department, overlooking Lincoln Park and Lake Michigan, five minutes walk to beach. Forty-hour week, good salary. Write: Personnel Department, Columbus Hospital, Chicago, Illinois.

WANTED: REGISTERED PHYSICAL THERAPISTS for staff positions. Rehabilitation Department of a 115-bed hospital soon to be enlarged to 309 beds. Salary commensurate with experience; 40-hour week, sick leave, paid vacation, free meals. Apply: Raymond T. Wise, M.D., New Britain Memorial Hospital, New Britain, Connecticut.

IOWA METHODIST HOSPITAL, DES MOINES, IOWA, needs registered physical therapist. Hospital has 400 beds, including 100-bed Raymond Blank Memorial Hospital for Children. Plans under way for construction of 120-bed chronic disease unit. Post-polio cases, in- and outpatient work. Competent professional staff and assistants, excellent working relationships. Apply A. D. Damiani, Personnel Director.

THREE STAFF POSITIONS available, Grace-New Haven Community Hospital. Two well equipped departments with a varied case load of in- and outpatients. Also home treatment mobile unit for rheumatoid arthritics. Four-week vacation plus 7 holidays, sick leave and retirement plan. Medical supervision under T. F. Hines, M.D., physiatrist, Dir.; R. V. Jones, M. D., physiatrist, Asst. Dir. Apply to Miss Edith Nyman, Supervisor of Physical Therapy, P. O. Box 1001, New Haven 4, Conn.

SUNNY SOUTHERN CALIFORNIA County Hospital has a vacancy for a physical therapist. Fully equipped department, paid vacations, sick leave, Health Insurance plan, and retirement program. Starting salary $343, increases to $417. Excellent nearby desert, mountain, and seashore recreational facilities. Write San Bernardino County Civil Service and Personnel Department, 236 Third Street, San Bernardino, California.

QUALIFIED PHYSICAL THERAPIST: (Female). Immediate placement in rapidly expanding orthopedic clinic. Close supervision by physiatrist; 40-hour week, vacation and sick leave benefits. Salary open. Will consider recent graduate. Apply A. E. White, M.D., Anderson Clinic, Arlington, Virginia.

(continued on next page)

Classified WANT-ADS

RATES

The rate per insertion is $1.00 per line. Typewrite your advertisement carefully and count 50 characters and spaces per line.

ALL WANT-ADS MUST BE PAID FOR IN ADVANCE. Make checks or money orders payable to the American Physical Therapy Association.

Closing date for copy and cancellations is two months preceding publication date.

Institutions or physical therapists who do not wish their identity known may arrange for Blind Ad Code No. All such want-ads must include the following which will be counted as 2 lines:

Address replies to ..... care of The Physical Therapy Review, 1790 Broadway, New York 19, N. Y.

IMPORTANT

It is understood and agreed that the publisher shall have the right to reject or change the wording of any advertisement which in the opinion of the Editorial Board shall not be in agreement with the ethical standing of this publication.

Classified WANT-ADS

PHYSICAL THERAPIST for one of country's most modern and largest children's hospitals serving 17 county areas. Both inpatient and outpatient treatment. Polio center for this area. Modern and expanding facilities. Liberal employee benefits. Furnished apartments available on hospital property. Can place second therapist. Contact Personnel Director, Glenn H. Meadows, Children's Hospital, Akron, Ohio.

NEEDED: QUALIFIED physical therapist for staff position within agency or for home treatment program. Apply to Director, Curative Workshop, 615 N. Capitol, Lansing, Mich.

PHYSICAL THERAPIST: Wanted for active, well equipped department in 118-bed hospital with expansion program underway. Pleasant surroundings in north suburb of Chicago; modern housing. Recreational facilities and cultural activities available. Good salary, 40-hour week, varied cases treated. Apply to Personnel Director, Highland Park Hospital, 718 Glenview Avenue, Highland Park, Illinois.

REGISTERED PHYSICAL THERAPIST positions in California; fifteen modern State hospitals. Work with psychiatric, orthopedic, and other physical disabilities of varying age groups. Immediate openings for graduates of approved physical therapy schools who are registered in California. Attractive employee benefits. For detailed information and salary schedules effective July 1, 1957, write Medical Recruitment Unit, California State Personnel Board, 801 Capitol Avenue, Sacramento, California.

REHABILITATION DIRECTOR—$4,060-$4,957.
City of Rockford, Illinois Municipal Tuberculosis Sanatorium. Apply: Civil Service Commission, 126 South First Street, Rockford, Illinois.

Positions available for 1 ASSISTANT CHIEF and 1 STAFF therapist; 300-bed hospital with outpatient service. Located in fine sports area, only 25 miles from Detroit. Modern equipment, substantial salary, good personnel policies. Contact Marie C. Hickey, Chief Physical Therapist, St. Joseph Mercy Hospital, Pontiac, Michigan.

PHYSICAL THERAPIST: Staff position. Opportunity for varied experience; 650-bed general hospital, near center of cultural and educational activities. Vacation, sick leave and social security benefits. Apply Personnel Director, Harper Hospital, Detroit 1, Michigan.

Registered PHYSICAL THERAPIST, male or female, to take postgraduate training in the Kenny Method of Treatment of Poliomyelitis and other neuromuscular disorders. The course includes didactic work and practical application under the direction of a complete rehabilitation team. Excellent scholarship granted to accepted applicants. Placement assured after completion of course. Write to: Personnel Director, Sister Kenny Memorial Hospital and Rehabilitation Center, El Monte, California.

WANTED: PHYSICAL THERAPIST (female) for full or part-time work in orthopedic surgeon's office. Write to Daniel B. Eck, M.D., 144 South Harrison Street, East Orange, New Jersey.

WORK IN SOUTHERN CALIFORNIA: Physical therapists needed to staff new Rehabilitation Service at Rancho Los Amigos Hospital. All aspects of rehabilitation of all age levels including post-acute and convalescent care of respirator patients, general medical, and orthopedic disabilities and all aspects of bracing and prosthetics. In-service training program under direction of physical therapy instructor. Five-day 40-hour week, holidays, sick leave, vacation privileges, retirement benefits with Civil Service rights. New building and most modern equipment available. Quarters available; laundry furnished. Good beginning salary, annual increases. Write: Personnel Director, Rancho Los Amigos Hospital, Hondo, California.

WANTED IMMEDIATELY: Opening in physical therapy department with the Northeast Colorado Health Department. Excellent opportunity for advancement, very modern department, has outpatient clinic, superior salary, liberal vacation, five-day week, working hours 8:00 to 4:30, all legal and state holidays off. Will have supervision. Prefer male therapist. Apply to R. Neil Hunter, Chief Physical Therapist, Northeast Colorado Health Department, 700 Columbine, Sterling, Colorado.

WANTED: STAFF PHYSICAL THERAPIST (male or female) for teaching hospital of the University of Washington Medical School, Seattle, Washington, under supervision of physiatrist. Starting salary $325-$362 depending on experience; 40-hour week. Social Security, retirement plan, free laundry of uniforms. Write: Miss Gudrun Tandberg, Physical Therapy Department, King County Hospital System, 325 Ninth Avenue, Seattle, Washington.

QUALIFIED PHYSICAL THERAPIST for small residence school in the heart of the Berkshire Hills. Rehabilitation of children from 6 to 14, with a variety of orthopedic disabilities, including cerebral palsy. Eight weeks paid vacation. Write Miss Florence McConahey, Coolidge Hill School, 472 West St., Pittsfield, Mass.

PHYSICAL THERAPIST registered by the State of California or qualified to be registered, for staff position in private office or 350-bed general hospital. Salary range without experience start $350.00, $375.00 after 6 months; periodic increments. Liberal personnel policies. Apply L. W. Brouhard, 162 Clinton St., Redwood City, Calif.

TWO ADDITIONAL THERAPISTS needed to staff progressive rehabilitation center. Liberal salary with merit raises. Usual benefits plus fully paid life insurance and hospitalization plan, also a paid retirement and pension insurance. Write: Personnel Director, Oak Ridge Hospital, 725 Fremont Avenue North, Minneapolis 11, Minnesota.

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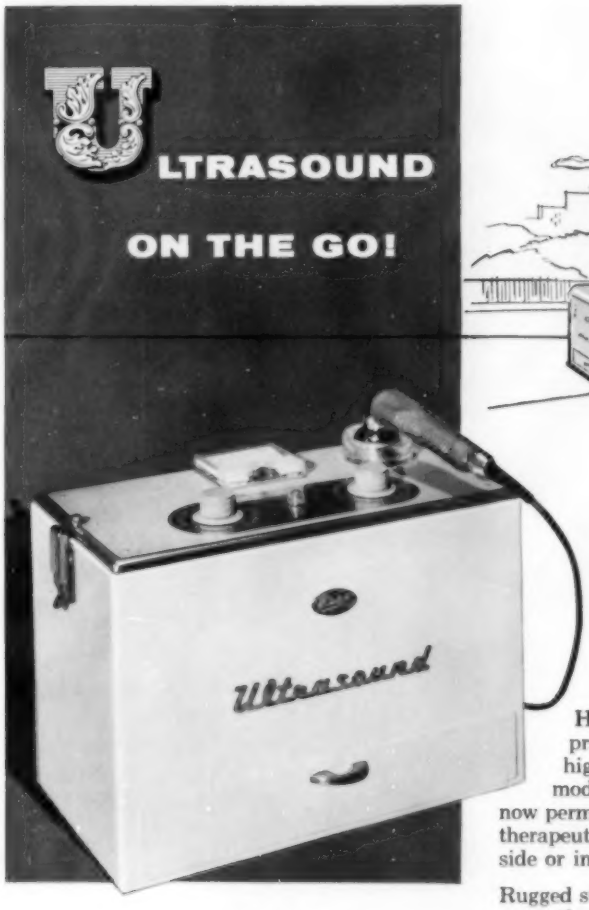

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Here is the answer to the busy practitioner's need for a compact, high-quality ultrasonic unit at a moderate price. The Burdick UT-4 now permits the wide use of this valuable therapeutic modality at the patient's bedside or in your own office.

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The UT-4 meets all four requisites of an ultrasonic unit — effective power, rugged portability, simplified operation and moderate cost. Your further guarantee of dependable performance is the uncompromising high standard of Burdick quality and workmanship.

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Total output	15 watts
Effective radiating area	6 square centimeters
Effective intensity	2½ watts per square centimeter
Dimensions	16" x 12" x 9"
Weight	25 pounds

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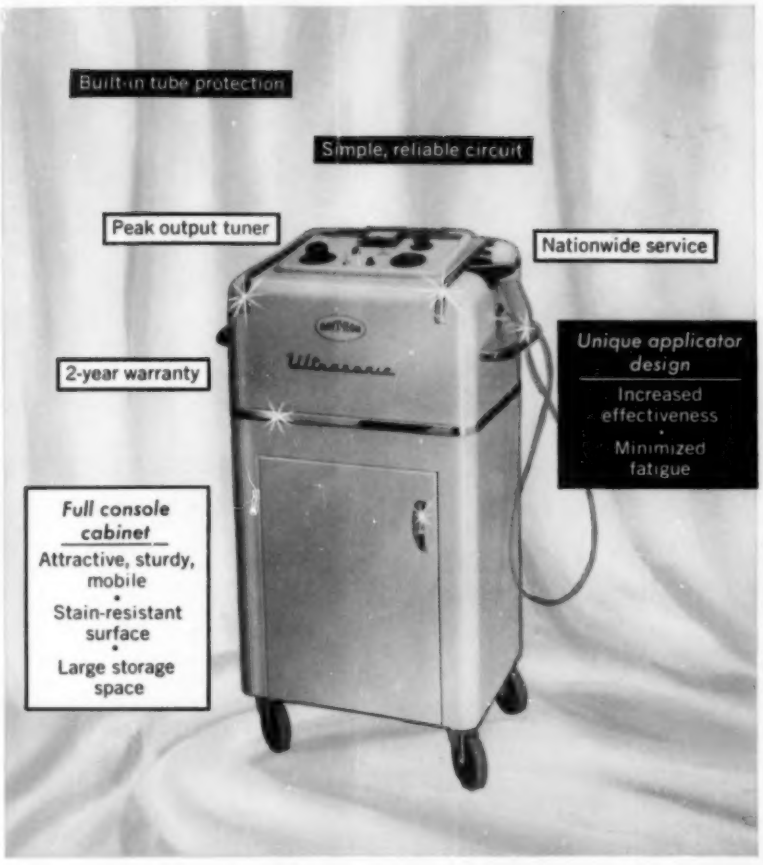

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